DOCUMENT RESUME

ED 052 743 24 HE 002 393

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TITLE The Campus as a Data Bank: College Students' Reactions to Social Scientific Experimentation; Research Implications. Final Report.
INSTITUTION California Univ., Santa Barbara. Dept. of Sociology.
BUREAU NO BR-8-I-166
PUB DATE Jun 71
GRANT OEG-9-70-0011(057)
NOTE 83p.

EDRS PRICE EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS *Experiments, Higher Education, Research Methodology, *Research Projects, *Social Sciences, *Student Attitudes, *Student Research

ABSTRACT

Three separate projects related to the field of study known as the "social psychology of experimental situations" are the subject of this report. This field is based on the fact that an experiment with human subjects necessitates social interaction between experimenter and subject; thus the social nature of an experiment may have an impact on its scientific aspects. In the first project, a random sample of undergraduates at the University of California, Santa Barbara, were asked about their attitudes concerning social science experiments and other aspects of their college careers. Reactions to the experimentation were generally favorable, although most students placed little value on their own participation. The second project was a role-playing simulation of the "classic" Festinger-Carlsmith experiment on forced compliance. Results and conclusions paralleled the original study. The final project was a "real" laboratory experiment in which 2 variables were manipulated to explore why subjects tend to lie in post-experimental interviews. It was found that high apprehension and low commitment lead to greater honesty. Implications for further research are discussed. (JS)

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Community and Organization Research Institute

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The research reported herein was performed pursuant to a grant with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

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SUMMARY

The present project included three separate studies all of which were relevant to the field of study known as the "social psychology of experimental situations." This field has its basis in the fact that executing an experiment with human subjects necessitates social interaction, of some form, between experimenter and subject. Experiments must be seen as both scientific and social occasions. Therefore the social nature of experiments may have an impact on their scientific aspects, i.e., experimental validity may be affected by the features of experiments as social occasions.

In the first study in this project, a random sample of undergraduate students at the University of California, Santa Barbara were interviewed in a social survey. Respondents were asked a number of questions relevant to their attitudes about and reactions to social science experiments and other aspects of college careers. It was found that the majority of the respondents had rather definite reactions to experiments, most of them generally favorable. Although the models of subjects and experiments proposed by various writers in the field (e.g., Riecken, 1962; Orne, 1962, 1969) received some support, none of the models was sufficiently complex to account for the range of responses exhibited by our respondents. Generally speaking, the students saw experimentation as scientifically important and useful. However, they saw little personal value in or enjoyment of their participation as subjects in experiments. Experiences in experiments caused respondents to place a higher value on experimentation as a method of increasing scientific knowledge, but had no systematic relationship to subjects' attitudes about the social sciences or to their attitudes about other features of their college experiences.

The second study was a "role-playing" simulation of the "classic" Festinger-Carlsmith (1959) experiment on forced compliance. The Festinger-Carlsmith study has been the focus of a great deal of controversy; theoretical controversy between dissonance theorists and incentive (reinforcement) theorists and methodological controversy between those who have criticized the experiment from a "social psychology of experiments" perspective and those who have defended it. Following a suggestion by Orne (1962), a role-playing simulation of the Festinger-Carlsmith experiment was run in which subjects were asked to read a description of the events of the study and to respond to measures of the dependent variable "as if" they had really experienced all they had read about. It was found that results from the simulated study almost exactly paralleled the results of the original study (for men). Again following Orne, it was concluded that the results of the original study may well have been a function of the social features of the experiment rather than of the independent variables that were manipulated.

The final study in this project was the execution of a "real" laboratory experiment in which two variables were experimentally manipulated in an effort to explore factors related to subjects' honesty in post-experimental interviews. A number of previous studies have shown that subjects are typically dishonest in post-experimental interviews, i.e., they refuse to admit prior knowledge of the experiment (knowledge the experimenter knows they have since he has had a confederate impart it to them). Since post-experimental interviews are an important means of gathering data in experimental research, it is extremely important to know why subjects lie to experimenters about their experiences. Based upon the previous two studies in this

project and upon a critical review of the relevant literature, it was hypothesized that two factors would influence subjects' honesty in post-experimental interviews--the extent to which subjects experienced "evaluation apprehension" (Rosenberg, 1965) or anxiety about having their personalities evaluated by the experimenter, and the extent to which subjects felt committed to the research (i.e., the amount of effort they expected to expend in their roles as subjects). It was found that both high apprehension and low commitment lead to greater subject honesty. Other features of the experimental design were successful in inducing subjects to be generally more "honest" than their counterparts in previous studies. Implications for research design were discussed

I. INTRODUCTION AND SPECIFIC AIMS

In the sciences, experimentation is generally believed to yield data which are epistemologically superior to data obtained through other research designs. Even in those types of scientific activity in which experimentation appears to be impractical, the logic of the experiment serves as the methodological paradigm in terms of which other research strategies are evaluated. "True" experimentation has long been a favored research strategy in the social sciences, particularly in the areas of social psychology, educational psychology, personality, and small groups. Only in the last few years, however, have social scientists who engage in experimental work become sensitive to the apparently unique methodological problems of successfully executing experiments on human subjects.

To satisfy the logic of experimental design, the social scientist, as any scientist, must adopt procedures that allow him to control, or to assume random distribution of, all variables other than the "dependent" variable he is studying. Ideally, through the design of his experiment, the social scientist hopes to control at known levels all variables which are "extraneous" to his hypothesis and which might, through their effect upon the dependent variable, confound interpretation of the data. But to control through experimental design the operation of effective extraneous variables, the investigator must be able to identify them.

The basis for the more recalcitrant of the methodological complications in controlling extraneous variables in the social sciences is that an experiment with human subjects is both a scientific event and a "social" event. Conducting an experiment with human subjects <u>necessarily</u> involves the experimenter and the subject in a system of social interaction with each other, no matter how circumscribed their relationship may be. The validity of experimental findings, therefore, depends, in part, upon the nature of the social relationship between subject and experimenter. More specifically, the validity of experimental findings may be said to partially depend upon (a) the extraneous information conveyed to subjects by the experimental setting and by the experimenter's behavior and (b) the extraneous expectations subjects <u>bring</u> to experimental situations. A subject's imported expectations about "experiments" will not only have direct effects upon his behavior, but will also serve as the frame of reference within which he will interpret the various features of an experimental situation.

The general hypotheses upon which this project was based are that (a) the social science "experiment" is a social object about which college students share expectations and that (b) the nature of such expections may influence the validity of experimental findings.

The project proceeded in two phases. <u>Phase 1</u> -- A random sample of undergraduate students at the University of California, Santa Barbara was interviewed about their previous experiences as experimental subjects, their attitudes toward experimental research in the social sciences, and their general attitudes toward other features of their college experience. Further, each respondent served as a subject in a "simulated" experiment which was part of the interview schedule. Analyses of data provided (1) a descriptive statement of the correlates of college students' reactions

to experiments in the social sciences and (2) a preliminary statement of the manner in which such reactions affect subjects' behaviors in experimental studies. Phase 2 -- Findings from Phase 1 served as the basis for designing and executing, in a conventional laboratory setting, an experiment. Significant dimensions of subjects' reactions to experiments were experimentally manipulated in an attempt to determine their effects in conventional experimental situations.

The reader will find the results from Phase 1 reported in the next two chapters of this report. In Chapter 2, the findings from the interview study are discussed. College students' reactions to social scientific experiments are examined within the framework of the five features of experiments identified by Riecken (1962) and the effects of subjects' backgrounds and experiences are explored. In Chapter 3, the results of the simulated experiment are presented. It is shown that the results of a "classic" social psychological experiment, the Festinger and Carlsmith (1959) study, were successfully replicated in a simulated or "role-playing" context. It is contended that the results of the original study may, therefore, have been a function of "demand characteristics" (Orne, 1962, 1969).

Finally, in Chapter 4, the results of a conventional laboratory experiment are presented. The findings indicate that two factors are particularly influential in determining one important facet of subjects' experimental performance, namely, evaluation apprehension (anxiety about being judged by the experimenter) and commitment to (involvement in) the experiment. It was found that high evaluation apprehension and low commitment both lead to greater subject "honesty" in the post-experimental interview. It is concluded that work in the "social psychology of experimental situations" does, indeed, have important implications for experimental design in all the social sciences.

II. THE SURVEY: THE COLLEGE STUDENT AS AN EXPERIMENTAL SUBJECT

Experimental research involving human subjects is an important, ongoing activity of many social scientists, particularly, but not exclusively, those in major universities. It is a safe estimate that the great majority of students in social scientific experiments are drawn from the student populations of these universities. Certainly it has been frequently observed that we haven't a "psychology of learning" but rather a "psychology of learning by college sophomores." Similar statements may be made, justifiably, about most experimentally based social science disciplines. It is surprising then, but true, that very little is known of students' (subjects') perceptions of and attitudes toward social scientific experimentation, and the way in which such reactions may influence the validity of experimental findings. The present investigation, based on interviews conducted with a random sample of University of California, Santa Barbara, undergraduate students, is intended to offer some insight into the manner in which subjects and potential subjects view experiments.

INTRODUCTION

A new body of literature is developing that is clearly largely unrepresented in standard textbook descriptions of social research operations. Hypothesis construction is no longer regarded as the sole province of the principal investigator, but rather as a major preoccupation of research subjects (Riecken, 1962). Members of the research team, be they hired interviewers and junior assistants or advanced graduate student experimenters, are increasingly viewed as conscious (Roth, 1966; Argyris, 1968) or unconscious (Rosenthal, 1963, 1966, 1969) data-biasers, a sharp departure from their traditional "professional" image. Professional concerns are not absent, however, from the research scene. Surprisingly, it is the research subjects rather than the junior researchers, who are thought to be imbued with the expectancies and motivations of the dedicated social scientist (Orne, 1962, 1969).

Despite the considerable diversity evident in recent studies of the "social psychology of research situations", they share a common perspective; namely that the social nature of social scientific research must be taken into account in study design, execution, and interpretation. Studies involving human beings are social situations in at least two contexts, each of which presents serious methodological problems.

First, conducting a study with human subjects, respondents, or informants necessarily involves the researcher and the person being studied in a system of social interaction, no matter how circumscribed their relationship may be. Any number of extraneous features of this data-gathering social interaction may adversely affect the validity of study findings. Recent studies of laboratory experiments have shown, for example, that the experimenter, in interacting with his subjects, is likely to inadvertantly reveal to them not only certain of his personal attributes (for example, his sociability), but also certain of his expectancies for their behavior in relation to the dependent variable (Rosenthal, 1966).

Second, studies involving human beings are social events in another sense--they take place within some larger, ongoing socio-cultural setting. This larger social context is thought to be an important determinant of the way in which participants view and react to research situations. For example, human experimental subjects, unlike mineral or animal subjects, are commonly "borrowed" from an university community tc which they must be returned after their tour of duty. Human subjects thus have the opportunity to (and are, in fact, likely to) share their experiences with their fellow students, students who may later become experimental subjects themselves (Wuebben, 1967). Perceptions of and definitions of experiments are therefore likely to become socially shared and structured within the university. Orne (1962) has speculated, for example, that subjects drawn from American culture come to experiments with built-in motivations to play the role of a "good subject" by helping confirm the experimenter's hypothesis as it becomes apparent through subtle cues or "demand characteristics".

When viewed as a social situation then, the validity of social scientific research depends, in part, upon (a) the extraneous expectations participants bring to research situations and (b) the social interaction that occurs during the research. The effect of the former on the validity of laboratory experiments is the primary concern of this paper. It may be contended that subject's imported expectations about "experiments" will not only serve as the frame of reference within which they will interpret the various features of an experimental situation, but will also have direct effects upon their behavior.

METHOD

The Survey

A random sample of 260 undergraduate students at the University of California, Santa Barbara were interviewed by 80 upper division students enrolled in a course in methods of social research. Several items of information on completed interview schedules were independently checked against information available from the registrar in order to eliminate "faked" schedules. The resulting sample of 217 valid interviews may be regarded as representative of undergraduate students at the University of California, Santa Barbara (UCSB). Even though UCSB is not necessarily representative of other "major" universities, it may be reasonably regarded as comparable to a wide range of publicly supported institutions of higher education in its general size (approximately 12,000) and educational status.

Most of the questions included in the survey were designed to tap major dimensions of students' reactions toward experiments. Since, to our knowledge, no other survey on this topic has been reported, two primary sources were consulted in the framing of potentially relevant questions. First, the speculative literature on the "subject role", primarily contained in works by Orne (1962, 1969), was a major source of ideas. Second, open-ended questionnaires which had been previously administered to groups of experimental subjects were carefully examined for "leads". The resulting interview schedule contained a series of attitude items potentially relevant to student-subjects' reactions to social scientific experimentation as well as standard demographic and background questions.

The Simulated Experiment

Each respondent in the survey also served as a subject in a simulated experiment which was part of the interview schedule. That is, each respondent was asked to read one of three descriptions of the experiences he would have had, had he been a "real" subject in a "real" experiment.[1] Each description corresponded to one of three experimental treatments in the classic experiment on "forced compliance" by Festinger and Carlsmith (1959).[2] After reading the descriptions and being asked to imaginatively "play the role" of a real subject, each respondent answered the same questions Festinger and Carlsmith used to measure their dependent variables.

Subject behavior in the simulated experiment may be viewed as a combined function of (a) the experimental treatment and (b) the subjects' perceptions of, expectations about, and attitudes toward experiments. For present purposes, however, analysis will be restricted to assessing the impact of subject-related factors on the results of the simulated experiment. A comprehensive analysis of the simulated experiment, which successfully replicated Festinger and Carlsmith's findings for male subjects (respondents), is presented in the following chapter of this report.

A Word of Caution

Before the major findings are discussed, it is necessary to stress the exploratory nature of our analysis. First, because we started with fairly broad theoretical notions (for example, prior experimental experience as an important determinant of subsequent reactions to experiments) rather than with precisely formulated specific hypotheses, it was necessary to search through a vast amount of survey data (over 100 variables) for "significant" fragments of evidence. Despite the obvious advantages of being able to refine and reformulate theoretical ideas as one "interacts" with the data, such a research tactic renders problematical the statistical meaning of tests of significance (Coleman, 1956:429; Selvin, 1957: 526; Kish, 1959:336). Second, survey inquiries of this type are also subject to "demand characteristics" and other methodological difficulties of a social nature (Hyman, 1950). For example, respondents may express favorable attitudes toward the social sciences simply because they believe that this is what the interviewer expects of them.

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[1] To control for "interviewer and experimenter expectancy" effects both respondents and interviewers were randomly assigned to experimental conditions. Interviewers were informed neither of the purpose of the simulated experiment nor of the various experimental treatments it involved. Further the authors were themselves ignorant of which interviewers had been assigned to which conditions.

[2] The decision to choose the Festinger-Carlsmith experiment for simulation was based on several considerations. First, the Festinger-Carlsmith experiment is well-known as one of the first experiments to successfully test derivations from what is perhaps the most influential theory in contemporary social psychology, the theory of cognitive dissonance. Second, although the theoretical basis for Festinger and Carlsmith's findings is disputed in the literature, the phenomenon measured in their experiment is stable; the experiment has been successfully replicated several times. Third, the methodology used by Festinger and Carlsmith is representative of the methodology employed in most experiments. Fourth, Festinger and Carlsmith's experimental treatments were easily presented in a role-playing format.

Because of these various analytical problems, we will forgo the common practice of testing the statistical "significance" of individual tables. Instead, we will attempt to evaluate various hypotheses using evidential fragments that may be gleaned from the present study and from relevant former studies. For example, our survey data on the effects of previous experience on subsequent experimental behavior will be supplemented by data from previous experimental investigations of this question. Such an approach is in the spirit of multiple operationism (Campbell and Fiske, 1959; Webb et. al., 1966:3-5). Given the limitations and systematic biases of all research procedures, we agree that it may be considered best to verify hypotheses by a wide variety of research techniques.

EMPIRICAL EVIDENCE

Noting that the process of collecting data about human behavior in an experiment may be viewed as a special form of social negotiation, Riecken (1962) has provided a way of conceptualizing subject-experimenter interaction as it is shaped by five potent features of experimental situations. Although we are not principally concerned here with the process of negotiation, Riecken's five features will serve as a useful framework within which to present our "background" data.

Features of the Experiment as a Social Situation

1. It is invitational. Since experimental subjects are usually recruited by "invitation" rather than by "command", Riecken (1962:28) reasons that persons who accept the invitation do so because they expect some rewards for their participation. Pre-experimental expectations of reward, whether the creation of the experimenter (pay, academic credit, prizes, etc.) or of the subject himself (satisfaction of curiosity, self-insight, etc.), are thought to significantly influence subject behavior.

While it is technically correct to describe subject recruitment as "invitational", it is somewhat misleading in the sense that it fails to connote that the "invitation" is often difficult to refuse, especially when it is extended under the guise of a course requirement. Indeed, when the 108 experienced subjects interviewed in the present study were asked about the last experiment in which they had served as a subject, 75 percent mentioned a course requirement as their reason for participating. "Volunteers" were nearly evenly divided between those who participated for money or additional course credit, 7 percent; for miscellaneous reasons ("help a friend", "curiosity", etc.), 8 percent; and for unspecified reasons ("just volunteered", etc.), 9 percent.

That as many as three-fourths of the experienced subjects in our random sample had been required to participate in experiments as part of their course work lends credence to the suggestion that many subjects may come to experiments with negative feelings instead of the positively-toned expectancies suggested by Riecken. Although direct examination of this issue is not possible in the present study, we can explore the hypothesis that "involuntary" subjects describe their experimental experiences in less favorable terms than do "volunteers". The findings are unfortunately inconclusive. When asked, via open-ended questions, to reveal both the "liked" and "disliked" aspects of their last experimental experience, "involuntary" subjects mentioned more dislikes (67 percent as against 41 percent of the "volunteers") and "volunteers" cited more likes (85 percent as against 75 percent). Comparison of the two groups on more structured items (ratings of their last

experimental experience), however, yielded no substantial differences.[1]

The fact that most students served as subjects to fulfill a course requirement does not preclude the possibility that such subjects also had other motives for participating, such as a desire to help science or to satisfy their curiosity. Unfortunately, our interview schedule was not adequately structured to enable extensive probing of these more "personal" reasons for experimental participation. In any event, it seems unlikely that <u>direct</u> questionnaires or personal interviews, with attendant demand characteristics, are appropriate means of securing valid data on subject motivation.

There is weak evidence from other studies that "curiosity" and "interest" are more important motives for experimental participation than is a desire to "help science". In a group of 28 volunteers recruited from a night psychology course for a sensory deprivation experiment, 14 students reported volunteering out of curiosity, 6 mentioned financial considerations ($1.25 per hour for 12-15 hours), and only 2 were concerned with helping science (Jackson and Pollard, 1966:385). Gustav (1962) also found "curiosity" and "interest" type reasons prevailing among responses given to sentence completion tests by New York University students who were favorably disposed to a departmental rule requiring experimental participation as part of the introductory psychology course. It should be noted, however, that approximately 40 percent of the psychology students expressed negative attitudes about the course requirement of research participation.

If one were to attempt to summarize the meager findings thus far, one might conclude that subject motivation and recruitment is too complex to codify by simple models which presume "volunteer" subjects who expect rewards for their performance or "good" subjects who expect to help the experimenter advance science.

In contrast to research subjects, the behavior of experimenters is easier to model as a result of their commonly shared beliefs about appropriate procedures for doing scientific experiments. Most experimenters, for example, believe that revealing their hypothesis to the subject before the experiment would invalidate the findings. It is to the practice of hypothesis concealment to which we now turn our attention.

2. <u>The terms of the experimenter's "invitation" are unspecified</u>. Although experimenters seldom disclose the nature and purpose of the experiment prior to execution, the subjects are not completely in the dark for they ordinarily have vague preconceptions about what occurs in social scientific experiments and how they should behave as research subjects (Riecken, 1962:28). The content of subjects' imported expectations about experiments is thought to be shaped by formal contact with social scientific thought and practices as well as by everyday social experiences. The extent to which students in our sample were formally exposed to views about experiments is discussed below. Then we shall explore the nature of subjects' preconceptions.

Suppose that the random sample of students in the present study had been drawn for the purpose of an experiment rather than an interview. Would we have

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[1] Respondents were given ten response choices (from "very strongly agree" to "very strongly disagree") to indicate their reactions to various aspects of their last experimental experience, including: if they enjoyed being a subject, if their experimenter knew what he was doing, if they tried to figure out the experimenter's hypothesis, if they tried anything to foul up the experimenter, and if they took their duties as a subject very seriously.

obtained subjects who were largely unacquainted with experimentation? To the contrary, about half of the sample (51%) reported having served as a subject in one or more experiments.1 A large majority of the experienced subjects (76%) had, in fact, participated in at least two experiments. In addition, slightly over a third of those without experimental experience (18% of the total sample) reported that fellow students had talked to them about participation in an experiment. The students were also well exposed to another potent channel of information about experiments: many reported having taken at least one course in psychology (71% of the total sample) and in sociology (54%). Thus, only a very small minority of the sample--the 12 percent who lacked exposure to psychology courses, to experiments, and to experimental subjects--could reasonably be classified as naive subjects.

Obviously this profile of our random sample is not representative of subject pools of college freshmen and sophomores enrolled in their first course in psychology or sociology. Nevertheless, cross-tabulation comparisons of the experienced students versus the "unexperienced" students across a number of background items (sex, year in college, major, exposure to psychology and sociology courses, grade point average, age, birth order, religion, **marital status**, father's occupation and education, and place of school residence) failed to disclose any substantial differences between the two groups aside from exposure to psychology courses. Students previously enrolled in psychology courses were over three times as likely to have participated in an experiment (64% than were those without formal classroom contact with psychology (18%).

Given the considerable exposure of the sampled students to social scientific thought and practices, it is likely that they have formed some definite opinions about experimentation. In this regard the responses to a series of structured attitude items are very striking: The students nearly unanimously agree that experiments produce knowledge of benefit to mankind, although they held more divergent opinions about benefits to participating students. For example, the students were given ten response choices (from "very strongly agree" to "very strongly disagree") to indicate their reaction to the statement that "experiments with human subjects will eventually produce knowledge which will be of considerable benefit to mankind." Nearly half (49%) picked the strongest affirmative category ("very strongly agree") to respond to the statement, and only 6 percent expressed any amount of disagreement. Similarly, a majority (71%) of the students thought that the Festinger and Carlsmith (simulated) experiment may have scientific value, although they were in little agreement as to what that might be.

In contrast to the opinions expressed about the scientific value of experiments, the responses to attitude items about the value of experiments to subjects were quite heterogeneous with little clustering on any response category. For example, the statement that "most students look forward to serving as subjects in social science experiments" was strongly or moderately agreed with by 25 percent of the students, slightly agreed with by 33 percent, slightly disagreed with by 25 percent, and strongly disagreed with by 17 percent. Similar response spreads were evident on

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[1] To avoid confusion of experiments with other types of studies, the following question was read to the respondents: "As you may know, social scientists in the last few years have been very active in conducting experimental studies of human behavior. Of course many social scientists continue to do questionnaire and interview studies, like the one we're doing. But increasingly they attempt to bring students to a laboratory or some other meeting place where the students serve as subjects in an experiment, Have you ever served as a subject in any experiment conducted by a psychologist, a sociologist, or any other social scientist?"

attitude items concerned with reactions to course-required experimental participation and the enjoyment that participating subjects may experience.

It is exceedingly difficult to determine the content of subjects' preconceptions about experiments by direct inquiry for the preconceptions that influence behavior in an experimental setting may also affect responses in an interview setting. Our sampled students, for example, may have expressed favorable attitudes about the utility of experimentation because they believed this to be the response sought by the researchers. Indeed, the behavior of subjects in any research situation may be affected by their awareness of being studied for a scientific purpose.

It is easier to demonstrate probable effects of subjects' preconceptions than to determine their specific context. One technique for studying how subjects' preconceptions affect the way they interpret experimental stimuli involves modifying features of the experiment that are extraneous to the true experimental variable to ascertain if subject behavior is affected. For example, Rosenthal (1966:245-246) has reported that manipulating the appearance of research rooms to make them look more "professional" enhanced the capacity of experimenters to unintentionally bias their results. Presumably, the appearance of the room conveyed to the subject information about the status of the experimenter or the experiment. Another study illustrating the effect of the research scene was Silverman's (1968), in which subjects showed more acquiescence to a persuasive message when it was presented in the context of a psychological experiment than in the context of a student sponsored survey. In another study (Kroger, 1967), standard psychological tests were administered to randomly assigned ROTC students in two quite different test-taking situations: (1) a "military" condition in which the test instruments were given in the military science department as a test of military effectiveness and (2) an "artistic" condition in which the tests were labeled as tests of artistic ability and were administered in a psychology laboratory containing art posters, art magazines, and the like. The two conditions led to large differences in test performance. Thus the experimental setting and the research "cover story" may interact with subjects' preconceptions and effect their behavior quite independently of the true experimental variable.

The above studies seem to suggest that subjects in our culture have a preconceived model of the experiment as being an orderly arrangement of carefully planned scientifically-rational events. If the events of an actual experiment conform to this model, subjects may feel obligated to help advance science by seriously playing the role of a "good subject". For example, subjects may acquiesce less to a persuasive message in the context of a student sponsored survey because such a setting does not trigger the expectation that attitude change is appropriate to the same degree that will occur in a well-executed experiment. Conversely, if the events of an experiment violate the subject's preconceived model, he may become suspicious and his behavior may be affected.

Another factor thought to influence subjects' perceptions of appropriate behavior is the nature of the status relationship between the experimenter and the subject. It is to this feature of the social experiment that we now turn our attention.

3. <u>The experimenter is a powerful figure</u>. Riecken (1962) and Rosenberg (1969) have proposed that experimenters, particularly psychologists, are viewed as powerful figures who have the ability to penetrate "common human disguises" for the purpose of evaluating a subject's emotional adequacy, mental health, and other personality attributes. Whenever experimenters do anything to confirm this suspicion,

the subject is likely to experience "evaluation apprehension" or concern with presenting himself in such a manner that he receives positive evaluation and avoids negative evaluation from the experimenter. For example, Rosenberg (1965) has contended that offering inordinately large amounts of money to subjects for publicly lying about a personal attitude in the low-dissonance (no attitude change) condition of certain cognitive dissonance experiments may inhibit attitude change because of the presence of evaluation apprehension rather than the absence of cognitive dissonance. That is, subjects may believe that giving evidence of attitude change after receiving a large sum of money would create the bad impression with the experimenter that their integrity was for sale. Another well-replicated finding, that lends itself to a favorable self-presentation interpretation, is the general reluctance of non-naive subjects to admit preexperimental knowledge of the experimental hypothesis during the post-experimental interview (Levy, 1967; Golding and Lichtenstein, 1970). It may be contended that these subjects believe that the disclosure of their failure to admit their prior knowledge to the experimenter before they went through the experiment would bring into question their character or moral integrity.

Riecken (1962;29) proposes that subjects may also harbor ambivalent feelings toward the experimenter as he is a person to be respected and trusted as well as to be feared for his powers of personality insight. Orne has suggested that it is this very faith in the experimenter's integrity that leads subjects to seemly commit dangerous and antisocial acts such as handling poisonous snakes or applying strong electric shocks to another individual (Orne and Evans, 1965; Orne and Holland, 1968). According to Orne, subjects are willing to engage in such activities because they believe that experimenters would not <u>really</u> request them to do something dangerous or unethical.

The conjecture that experimenters are highly respected by their subjects is supported by the favorable ratings our experienced subjects gave the experimenter in their last experiment. Nearly half of our sample picked the strongest affirmative category ("very strongly agree") and only 12 percent expressed any disagreement with the statement that "my experimenter seemed to know what he was doing in conducting his experiment." In addition, over three-fourths of the subjects agreed with statements to the effect that their experimenter was "a very pleasant or very helpful person" and not "stiff and formal in his behavior".

If these evaluations have any validity, it appears that experimenters are generally viewed by their subjects as competent and pleasant individuals. Do subjects at the same time, however, fear the "psychological powers" of the experimenter? Our data relevant to this question is very limited. All surveyed students were asked to respond to the statement that "students in experiments are often uncomfortable because of what the experimenter might find out about them." Nearly as many agreed (51%) as disagreed with this statement, and there was little clustering on any of the ten response categories. Responses to this statement were unrelated to prior exposure to actual experiments. Although is is impossible to reach any firm conclusion about subjects' evaluation apprehension from this single questionnaire item, it is noteworthy that the observed diffuse response pattern is the opposite of what might be expected if evaluation apprehension were a major concern of most subjects.

4. <u>The segregation of the experiment from everyday life.</u> Although experimenters tend to view subject behavior as "data" set apart from everyday life, Riecken (1962:30) proposes that subjects may not share this perspective for several reasons. First, the role of a representative "data-producer" is alien to many

subjects who may wish, instead, to be recognized for their qualities as unique human beings. Second, student subjects may suspect that the impression they make on the experimenter, be it good or bad, will affect their academic careers at some later time. For example, if the experimenter is also the subject's teacher, the subject may believe that the experimenter will be unable to ignore his experimental performance in evaluating his academic performance. Thus subjects have other reasons for being apprehensive about the experimenter's evaluation in addition to his alleged powers of personality insight.

From the experimenter's perspective, the data produced by each subject is viewed as a sample of human behavior which is <u>independent</u> of the behavior of other subjects and the events of the world outside the laboratory. Indeed if the experiment is to be scientifically useful, the observations that comprise the data must be independent of each other. Otherwise, the experimenter will normally be unable to legitimately apply statistical tests to determine whether or not observed relationships were due to chance factors. A serious threat to the assumption of independent observations is the possibility of communication between earlier and later run subjects. To fully appreciate the methodological implications of "illicit" post-experimental communications, we must consider certain features which are typical of most experiments in the social sciences.

In the usual experiment, successful manipulation of independent variables and/or valid measurement of dependent variables can be accomplished only if subjects are ignorant of certain aspects of the experiment. Experimenters regularly rely upon three related sets of practices in an effort to assure such ignorance. First, subjects are procured from populations which are believed to be both unknowledgeable about experiments in general and deceivable, e.g. college freshmen and sophomores who are taking their first course in sociology or psychology. Second, when subjects arrive for an experiment they are given a cover story which is designed to conceal certain true facts about the experiment while at the same time facilitating its execution (Aronson and Carlsmith, 1968). Third, since most studies process subjects sequentially, a "used" subject is allowed to return to the subject population only after he has promised not to tell anyone about the experiment. It is presumed that he will keep his promise and that, therefore, subjects who come to later runs of the experiment will be as naive and gulliable as he supposedly was.

The tenability of the presumption that subjects keep their promises not to talk to others about experiments has been put into question by a number of recent studies (Lichtenstein, 1968; Rokeach, Zemach, and Norrell, 1966; Wuebben, 1967, 1969). These studies indicate that (1) the proportion of subjects who break their pledges to secrecy is very high, probably greater than 50 percent and that (2) subjects who do talk, talk to an average of more than two other persons.

The information provided by our respondents about their last experimental experience confirms the findings that subjects talk considerably about their experiences, even when requested by the experimenter not to talk. First of all, the arrangement of activities in many experiments presented an opportunity for inter-subject communication. Over half (58%) of the 108 experienced subjects reported that there were other subjects who went through the experiment at the same time they did. Of this group, 25 percent admitted talking to fellow subjects before the experiment began and 60 percent talked to other subjects after the experiment.

About half (51%) of the experienced subjects were asked by their experimenters not to talk to other students about their experiences in the experiment. These

respondents were asked the following question:

> Most students say that even though they have been asked not to talk about an experiment, they nevertheless usually do talk to some of their friends and acquaintances about it. Did you talk to other students about the experiment in which you participated?

A majority (64%) of those who had received a request for post-experimental silence admitted that they later talked of the experiment. Those who talked, reported talking to an average (mean) of 3.6 persons.

In a study of some of the factors related to whether or not subjects talk to others about their experiences in an experiment, Wuebben (1969) found that the experimenter's request for post-experimental silence does effectively deter some subjects from talking. Of those subjects who had received no request for silence, 92 percent said that they had talked to others about the experiment they had been in (one week intervened between the experiment and the questionnaire asking about talking). However, 50 percent of the subjects who <u>had</u> received a plea for post-experimental silence said that they had talked to no one.

Data from the present study do not support Wuebben's findings. Subjects who had received a request for silence were just as likely to report talking with others about the experiment (64% talked) as those who had received no request for silence (64% talked). Methodological differences between the two studies may account for these discrepant findings. In the present study, if he received no request for silence the subject was simply asked, "Did you talked to other students about the experiment in which you participated?" However, if the subject had received a plea for post-experimental silence, the question about talking was prefaced by the statement that "most students . . .nevertheless usually do talk . ." This preface may have biased the subjects who had been asked to remain silent.

The present study shows that several factors may encourage inter-student communication about experimental experiences. First, it appears that the students who are involved in a positive way in the academic life are more likely to talk to others about experiments. Students who <u>disagreed</u> with the statement that "the main emphasis in courses is on repeating what the faculty member has said in class" were more likely to talk about their experimental experiences (85% out of 34 subjects) than those who agreed with the statement (58% out of 64 subjects talked). The "talkers", as compared with those who remained silent about their experimental experiences, were more likely to agree that "faculty members seem interested in their students", reported having taken more psychology courses, and tended to have slightly higher grade point averages. In addition, those among our experimentally-unexperienced respondents who disclosed that fellow students had talked to them about participation in an experiment had higher average grades than those who did not talk with their peers about experiments. Taken together, these diverse findings support the hypothesis that inter-student communication about experiments occurs more frequently among the academically involved.

Second, there is evidence that inter-student communication about experimental experiences is related to situational factors. Some students move in social settings that provide good opportunities to talk with others about experiments. For example, students who reside in communal living arrangements such as dormitories or fraternity houses were slightly more likely to report talking about or hearing about experiments than those living in private apartments. Subjects who participated in their last experiment because of a course requirement

also displsyed a higher propensity to talk about their experience (70 percent talked as against 46 percent of the "volunteers"). Presumably, these "involuntary" subjects may have talked with others in the course in which experimental participation was a requirement.

The conclusion to be drawn from the studies of inter-subject communication is that independence of observations may be the exception rather than the rule in the typical experiment. Subjects do talk and most do not honor their promises of silence. Thus it must be considered likely that at least some later run subjects in the typical experiment will have received illicit information about the study prior to their participation in it. The proportion of such "contaminated" subjects may be expected to vary widely with any number of factors, however. For example, subject contamination is likely to vary inversely with the size of the subject pool.

5. Asymmetrical information flow. The experiment is frequently conceptualized as a lopsided game in which the advantaged player, the experimenter, not only controls the flow of events but also witholds information from the subject about both the study's purpose and the criteria being used to evaluate the subject's behavior (Riecken, 1962; Mills, 1962). The subject or disadvantaged player, then, faces a problem-solving situation in which he seeks to learn the nature of the game from the limited information revealed by the experimenter and the experimental procedures.

The characterization of subjects as players prone to construct hypotheses that "make sense" out of the experimental situation is appealing but must be regarded as an empirical question. Evidence from the present study suggests that hypothesis construction may indeed be a general concern of subjects. For example, 72 percent of our experienced subjects selected an affirmative category in response to the statement that they were "particularly concerned with trying to figure out the experimenter's hypothesis" while in the experiment. The two strongest of the five affirmative categories were picked by 39 percent of the subjects.

The experiment also has other features in common with "games". Just as the winner is not expected to disclose his winning secrets to the other players after the game, most experimenters apparently feel no need to debrief subjects after an experiment. Somewhat surprisingly, half (50 percent) of our experienced subjects reported that the experimenter never told them the purpose of the experiment. About one-fourth (24 percent) were debriefed after the experiment, 18 percent were told the purpose before or during the experiment, and the remainder (8 percent) were uncertain or failed to respond. Since some of the subjects who were informed during or before the experiment may have been given a false "cover story", a large majority of our experienced subjects probably never learned the true purpose of the experiment in which they served.

What effects does not learning the purpose of the experiment have on subjects? This is an important question since most university students serve as experimental subjects sometime during their educational careers. Students' reactions to such experiences form a part of their response to the total educational experience and may be particularly important in influencing their attitudes toward the social sciences. Failure to learn the purpose of the experiment had measurable effects in our sample of 108 experienced subjects. Those who were never told the purpose or the experiment, as opposed to those informed, rated their experimental experience as less enjoyable (mean rating 4.7 as against 3.6, $t = 2.36$) and their experimenter as less pleasant (mean rating 4.2 as against 2.4, $t = 3.83$). In addition, there

was a slight tendency for the "not informed" subjects to question the accuracy of the experimental findings (mean rating 4.3 as against 3.8, t = 1.08). Statistically controlling for the time lapsed since the respondent's last experimental experience did not appreciably change the observed pattern of more negative ratings being associated with failure to learn the experiment's purpose. While it is not possible to generalize from these data, they do suggest that students' experimental experiences may affect their attitudes toward both experimental practices and certain social scientific disciplines.

Portrait of a subject. The forgoing portrait of our respondents' backgrounds and attitudes underscores the implausibility of the formerly held conception of subjects as passive responders to experimental stimuli. A more appropriate model of the human subject, apparently, is that of an active, fairly intelligent information processor who uses the limited information revealed by the experimenter and the experimental procedures to construct hypotheses both about the study's purposes and about how his behavior will be evaluated. A potent influence on the way such hypothesis-prone information-seeking subjects come to define the meaning of experimental situations is the set of general expectations that they bring with them to experiments. The content of subjects' imported expectations about experiments, in turn, may be partially shaped by prior contact with social scientific literature, courses, experiments, and experimental subjects.

An explanation of why subjects are not passive responders to experimental stimuli must begin with noting the previously-discussed features of experimental situations. The typical experimental experience, for example, is not designed to instill neutral feelings in subjects. Usually subjects are "coerced" by a course requirement into participating in a situation in which the experimenter intentionally conceals information about the nature and purpose of the study. Thus the subject may harbor hostile feelings arising from being impressed into service along with his generally favorable attitudes toward the social sciences and experimentation. He may also have ambivalent feelings about the experimenter, a man to be trusted and respected, but also to be feared. In addition to these diverse attitudes, further complications are introduced by the variety of sources that subjects may draw upon if they wish to decipher the study's purpose. Often the experimenter inadverently assists the subject in obtaining such information. For example, he may stage his production in such a way that prospective subjects have ample opportunity to talk with earlier-run subjects either at the experimental site or in the introductory social science course from which the subjects are typically recruited. Further, the experimenter may inadvertently, through his manipulations, convey to the subject information about the purpose of the experiment.

The foregoing model of the subject has yet to be empirically verified. Although our data are in agreement with this conceptualization, serious questions about the validity of any interview responses must be entertained. First, since the interviews were constructed on the basis of speculative literature on the "subject role", the interview schedule may have spuriously generated confirmation of the positions taken in this literature. For example, had we not directly asked our experienced subjects structured questions concerning their efforts to decipher the experimenter's hypothesis, evidence supporting the model of subjects as active hypothesis-seekers may not have surfaced, i.e., the very asking may suggest the answer. Second, as previously noted, interviews are subject to the same sort of methodological difficulties as are experiments.

In the two sections which follow we will attempt to fortify the evidential base of our social psychological model of the human subject by examining data

relationships that are less susceptible to the foregoing criticisms. We will examine whether or not subjects' reactions to experiments and their prior experimentally-related experiences have an effect on their subsequent behavior in real and simulated experiments. First we will explore the effect of previous exposure to social scientific information and practices.

Subject Behavior and Prior Exposure to Social Scientific Thought and Practices

Implicit in the operating procedures of most experimenters is the notion that experimental stimuli will arouse intended states only in "naive subjects". For instance, it is thought that subjects who have been previously fooled in a "deception" experiment may attach different meanings to the events in a subsequent experiment than will unexperienced (undeceived) subjects. Similarly, exposure to communication channels relevant to experiments (social scientific literature, course lectures, campus scuttlebutt, etc.) is thought to jeopardize subject naivete.

The available empirical evidence bearing upon the "naive subject" formulation is equivocal. Some studies have shown that "deceptions" and "debriefings" in earlier experiments do not appreciably affect the performance of subjects in later experiments (Fillenbaum, 1966; Cook, et. al., 1970). But other studies have found that performance does vary with previous experience (Holmes, 1967) and prior deception (Silverman, et. al,, 1970).

It is difficult to reach any conclusion from such mixed findings for the relevant studies differed in many ways that might have affected the results, e.g., the nature of the experimental tasks employed in the prior and test experiments, the time interval between successive experiments, and the "cover" story given. There are some other findings, however, that provide some clues which may be used as a basis for speculation. First, the impact of prior experimental deception may only be significant in subsequent experiments that closely resemble the earlier "deception" experiment (Brock and Becker, 1966). Second, previous experimental experiences may affect subject motivation (Holmes and Appelbaum, 1970), which in turn may influence the states aroused in subjects by subsequent experimental stimuli. For example, prior deception may both arouse subjects' suspicions and decrease their interest in performing as a "good" subject. In other words, the effects of experimental experience on subjects' states may be unusually complex.

In order to further explore the validity of the "naive subject" formulation, we divided our respondents into five groups based on their reported previous exposure to experimentation: 68 uninformed respondents who had neither participated in experiments nor talked with experienced subjects about experiments, 39 informed respondents who had talked with experienced subjects but had not themselves served as subjects, 26 one-experiment veterans who had served once as subjects, 32 two-experiment veterans who had participated twice, and 51 over-two-experiment veterans who had served in three or more experiments.

Those with greater exposure to experimentation were generally both less critical of experiments and more favorable in their expressed views about the value of experiments. The statement that "experiments are not a very important means of increasing our knowledge of human behavior" was given the strongest disaffirmative rating ("Very strongly disagree") by 31 percent of the uninformed, 33 percent of the informed, 42 percent of the one-experiment, 53 percent of the two-experiment, and 61 percent of the over-two-experiment veterans. Affirmative ratings of a similar statement, that "experiments with human subjects will eventually produce knowledge which will

be of considerable benefit to mankind", were also directly associated with exposure to experimentation. On the other hand, exposure was not systematically related to our respondents' ratings of other aspects of experimentation, including their appraisal of the reactions of students to course-required participation in experiments, the typical experiences of experimental subjects, and the motives of subjects.

The finding that subjects' exposure to experimentation may influence their attitudes about experiments is, of course, not unexpected (Cook, et.al., 1970; Holmes, 1967; Holmes and Appelbaum, 1970). The present data, however, further suggest that only one dimension of subjects' reactions to experiments--the perceived scientific value of experimentation--may be enhanced by experimental participation. Views about other facets of the experimental experience, including the pleasures and discomforts of being a subject, seem unaffected by actual experience. This is particularly interesting in that actual experimental experience should provide a better factual basis for evaluating these other facets of experimentation than for evaluating their scientific value. Of all the participants in an experimental situation, the "naive" subject would seem least qualified to assess scientific value.

These findings beg for post factum interpretation. Cognitive dissonance theory predicts that people often come to value things more highly after they have expended some effort on them. Since the typical experiment is not likely to be very enjoyable or even enlightening, the very-experienced subject has little left to justify his efforts except for a belief that his efforts were scientifically useful. This dissonance theory interpretation of the findings is also supported by other data. The effect of exposure is specific to attitudes about experimentation and does not extend to global attitudes about the social sciences. That is, our measure of exposure was unrelated to the respondents' rating of their respect for the social sciences. In addition, the disciplinary backgrounds of the respondents were unrelated to their views about the value of experimentation except when they were majoring in a discipline (e.g., psychology) requiring considerable experimental exposure.

Given that subjects' experimentally-related experiences may influence their views on the value of experimentation, such experiences may as well affect their behavior in subsequent experiments. The response data from our simulated experiment failed to confirm this hypothesis. The five differentially-exposed respondent groups did not differ significantly or systematically in their responses to the 18 questions (dependent variable measures and auxiliary questions) comprising our simulation of the Festinger-Carlsmith experiment. For example, the following question was asked after the subjects (respondents) in the simulated experiment had responded to the dependent variable measures:

> From the time you arrived for the experiment until the time you left, including everything you did while in the building, did you become suspicious of anything that went on or anything the experimenter said or did?

Prior experimental experience did not produce more suspicion in subjects as indicated by the following percentages of subjects who expressed suspicion: 75 percent of the uninformed, 82 percent of the informed, 77 percent of the one-experiment, 72 percent of the two-experiment, and 78 percent of the over-two-experiment veterans. Responses to the other 17 questions were similarly unrelated to prior exposure.

We also cross-tabulated our experienced subjects' ratings of their last experimental experience by the number of experiments in which they had participated. Again, no strong relationships were evident. There was a slight tendency for the more experienced subjects to express more negative views about the experimenter and the experimental room, but they also rated their experience as more enjoyable and acknowledged efforts to help the experimenter confirm his hypothesis. Thus our data, taken together with the literature discussed above, indicate that differential exposure to experimentation has, if any, only small direct effects on behavior in subsequent experiments.

The "naive subject" formulation, in its emphasis on actual exposure to social scientific thought and practices, may be said to overlook the importance of our general culture as a basis for subjects' preconceptions about experiments. Obviously, the ease with which experiments are performed is largely a function of their similarity to everyday social situations. In addition, it is the general culture that prepares subjects to expect "patterned and orderly stimulus experiences" (Alexander, et. al., 1970), to expect professional experimenters who will not do anything to actually harm them (Orne and Evans, 1965), to expect that the experimenter is interested in evaluating their personality (Rosenberg, 1965), and so forth.

The relative importance of actual exposure to social scientific thought and practices, as opposed to everyday social experiences, in affecting subjects' expectations about experiments cannot be determined with the available empirical evidence. If we were allowed to speculate, however, we would predict that in the future the "naive subject" formulation will be less influential as a methodological guideline for doing experiments. It appears that procedures intended to isolate "naive subjects" (for example, the post-experimental interview) have low reliability because of the overriding influence of subject motivational factors. Moreover, we suspect that motives and expectancies formed in the larger sociocultural environment (including concern with favorable self-presentation) are more important than those formed as a result of actual exposure to social scientific thought and practices.

The Motives of Experimental Subjects

Theoretical discussions of subject motivation may be conveniently grouped into three somewhat contradictory themes: (1) subjects in our culture are largely motivated to play the role of a "good subject" (Orne, 1962), (2) the alienating character of the typical experiment produces "bad subjects" (Argyris, 1968), and (3) subjects in an experimental situation suffer from "evaluation apprehension" and wish to "put their best foot forward" (Riecken, 1962; Rosenberg, 1965). Data bearing upon the latter theme was presented earlier. A brief discussion of the "good subjects" model and the "bad subjects" model follows.

The model of the "good subject" is intended to explain the apparent sensitivity of experimental subjects to the subtle, unprogrammed features of experimental situations, <u>especially</u> those which might convey the experimental hypothesis (such cues have been called "demand characteristics"). For example, in sensory deprivation experiments the typical procedure followed introduces into the experimental situation many features extraneous to the experimental manipulation (sensory deprivation). Such features may include pre-experimental screening for medical or physical disorders, emergency medical apparatus, forbidding release forms, careful instructions and the presence of a "panic (release) button".

Orne and Scheibe (1964) have shown that when such features are excluded from an experimental situation, no sensory deprivation behavior on the part of subjects occurs in the absence of actual sensory deprivation. However, the presence of such cues alone is sufficient to elicit "deprivation behavior" even though actual sensory deprivation has not taken place. Thus, in the typical deprivation study, the extent to which "deprivation behavior" is a function of reduced sensory stimulation (the presumed independent variable) as opposed to demand characteristics is problematic.

According to Orne, the "good subject" satisfies his need to perform well and advance science by consciously or unconsciously behaving in a manner designed to validate the experimenter's hypothesis as it becomes apparent to him through demand characteristics and other extraneous cues. The Orne model has proven to be extremely useful in explaining certain empirical phenomena. Now widely evoked in post factum interpretations, the model of the "good subject" has been proposed to explain a diversity of findings ranging from the reluctance of Levy's (1967) non-naive subjects to admit preexperimental knowledge of a verbal conditioning schedule during a postconditioning interview (the "good subject" does not want to invalidate his performance) to the process by which Rosenthal's (1967) experimenters unwittingly communicate their expectancies to subjects (the "good subject" is responsive to subtle cues from the experimenter).

It must be recognized, however, that the major assumptions underlying the "good subject" model have not been subjected to empirical test. For example, Orne assumes that subjects come to experiments with built-in motivations to help the experimenter confirm his hypothesis. Or again, Orne assumes that because subjects have great respect for the social sciences, they will gladly comply with almost any request an experimenter might make of them. Plausible as such assumptions seem, they are clearly speculative. Is it not equally plausible that some subjects might resent experiments and thus attempt to impede the progress of an experiment in which they find themselves? Or again, might not subjects feign naivete to outwit the experimenter rather than to validate their performance? What is the distribution of "good subject" types among subject populations? In spite of the inherent plausibility of the "good subject" model, an assessment of its explanatory and predictive capacity must await empirical inquiry into questions such as these.

Given the present lack of systematic empirical knowledge, it is not surprising that theorists of subject motivation frequently differ not only in their explanations of the same phenomena, they also are often in disagreement over the facts involved in an issue. A striking example of this observational selectivity is evident in the empirical phenomena cited by theorists of the "bad subject" persuasion. For every anecdotal account of the "good subject" mentioned in the literature, there must exist an equally persuasive account of the activities of his bad brother as the following passages illustrate:

> In operant conditioning, it is commonly observed that some Ss will show a nice learning curve, only to show a reversal at some point. If asked, Ss will say that they became tired of hearing "un huh" and wanted to see what would happen if they varied the response, or they might state that they did not want the experimenter to think he could control their behavior (Masling, 1966:95-96).

> In one major university, a formal evaluation was made of the basic

> psychology course by nearly 600 undergraduates...the students were very critical, mistrustful, and hostile to the requirement [that they had to participate in experiments]. In many cases they identified how they expressed their pent-up feelings by "beating the researcher" in such a way that he never found out (Argyris, 1968:188).

Observations of this sort have promoted limited speculation and theorizing (Argyris, 1968; Aronson and Carlsmith, 1968:62; Masling, 1966:95-96; Rosenberg, 1969:340-341) about the motives and prevalence of "bad subjects", a theme to which Argyris has contributed the most systematic treatment. Borrowing from organizational theory, Argyris (1968:193) argues that rigorous experimentation tends "to place subjects in situations that are similar to those organizations create for the lower level employees." Unaccustomed to being subordinates in a highly authoritarian system, research subjects may react by adapting employee ploys such as covert or overt withdrawal or opposition. One of these adaptive strategies, overt dependency upon the experimenter, is usually associated with the "good subject" model:

> The studies that show subjects as all too willing to cooperate are, from this point of view, examples of subject withdrawal from involvement and not, as some researchers suggest, signs of subjects' high involvement. To give a researcher what he wants in such a way that the researcher does not realize that the subject is doing this (a skill long ago learned by employees and students) is a sign of nonresponsibility and of a lack of commitment to the effectiveness of the research (Agyris, 1968:188).

Although they may disagree about everything else, the "good subject" and "bad subject" theorists are in agreement on one point--that is the implausibility of the former model of human subjects as passive responders to experimental stimuli. Instead, the new theorists stress the importance of subject motivation, although they disagree as to whether subjects are primarily motivated to help the experimenter (the "good subject") or themselves (the "bad subject" or the "evaluation apprehensive subject").

The foregoing discussion by no means covers all the current models of experimental subjects. Numerous other models have been proposed, including that of the "faithful subject" who remains faithful to the experimenter's instructions and refuses to seek out the true purpose of the study (Fillenbaum, 1966) and the "negativistic subject" who acts in the opposite way to the one he thinks is expected of him (Masling, 1966). More models, no doubt, are on their way. At the same time, however, research in this area is starting to move in a more productive direction. Instead of prolonged discussion over the relative merits of various subject motivational models, attention is now being given to the experimental conditions and to the subject population characteristics which may trigger one or more of the various components of subject motivation (for example, see Silverman and Shulman, 1970).

To what extent did the behavior of our respondents in their last actual experiment or in our simulated experiment reflect "good subject" or "bad subject" dispositions? We made an attempt to explore this question through open-ended questions about the respondents' reactions to their actual experimental experiences. In response to an open-ended query about what they <u>liked</u> about their last experiment, only 1 of the 108 experienced subjects mentioned a desire to help science. The more frequent responses to this question included: positive com-

ments referring to the nature of the experimental task or the experimenter (45%), the challenge of a new experience or being successful in the experiment (15%), the opportunity to learn something (7%), figuring out the purpose of the experiment (7%), and nothing liked about the experiment (22%). Subjects were less informative about disliked aspects of their last experimental experience: 39 percent reported nothing disliked, 28 percent had negative comments on the nature of the experimental tasks (e.g., "boring"), 12 percent criticized the experimenter for failing to reveal the results or the study's purpose, 6 percent felt that the experimenter had deceived them, 6 percent expressed concern over their performance (e.g., "didn't do well"), and 5 percent offered technical criticisms (e.g., "questions were loaded").

The responses to the open-ended questions concerning liked and disliked aspects of the last experimental experience fail to support either a "good subject" or a "bad subject" model. On the one hand, the preconditions of the "good subject" model--that subjects are motivated to help the experimenter confirm his hypothesis and advance science--are not prominently visible in the responses. On the other hand, the typical experimental experience seems to lack the alienating character presupposed by the "bad subject" model. That is, our experienced subjects by and large had more positive than negative comments to make about their experimental experiences.

Our respondents were also asked whether or not they did a good job as an experimental subject. About three-fourths (76%) reported that they did a good job. The most frequent reasons given for performing well were comments referring to a motivation or interest in doing well (37%), indications that they followed instructions faithfully (23%), and assertions that they had been honest (10%). Among the 26 subjects who felt they could have done a better job, the most frequently reported reasons were that the task was difficult (35%) or that they were unmotivated or uninterested (38%).

In addition to their general feeling of performing well as a subject, the experienced subjects by and large believed that the experiment in which they participated was worthwhile. Those who felt this way (97 out of 108 subjects) tended to offer vague or very general reasons why it was worthwhile from the experimenter's standpoint (e.g., "provides statistics", "otherwise it wouldn't have been given"), and a few (15 subjects) felt that they had personally benefited or learned something from the experiment.

Taken together, the responses to the open-ended questions about the last experimental experience suggest that the "good subject" component of subject motivation may be more salient than the "bad subject" component. These motives, however, do not appear to hang together in the way Orne hypothesized.

The "post-experimental" responses to the Festinger-Carlsmith (simulated) experiment support the contention that "good subject" motives are relatively disorganized and weak. Although nearly three-fourths (71%) of our respondents felt that the results of the Festinger-Carlsmith experiment would have scientific value, only 32 percent expressed a willingness to participate in another similar experiment. Those who did not want to participate explained that the experiment had no value to them (20%), that it was a waste of time (24%), that the experiment lacked a purpose (21%), and/or commented negatively on various aspects of the experiment (41%). Only 7 respondents mentioned a duty to science as a reason for participating again in a similar experiment. Thus it would seem that

the contentions of the "good subject" model are only partially borne out. Subjects may have great respect for and faith in science and experimentation, but they fail to fervently share the experimenter's sense of duty to advance science.

We now turn to an exploration of the structured attitude items. Our respondents were described earlier as generally holding positive attitudes about experimentation as reflected by their ratings of the importance of experiments as a means of increasing knowledge of human behavior. The respondents also expressed a high regard for the social sciences. For example, they were given ten response choices (from "very strongly agree" to "very strongly disagree") to react to the statement that "I have great respect for the social sciences." The two strongest affirmative categories were picked as a response to the statement by 64 percent of the respondents, and only 10 percent expressed any amount of disagreement.

It appears, then, that subjects generally come to experiments with positive attitudes toward social science research and experimentation. To ascertain whether or not such attitudes may have affected subject behavior in our simulated experiment, we cross-tabulated the responses to the four dependent variables (rating scales) from the Festinger-Carlsmith simulation with our respondents' expressed attitudes toward the social sciences (Table 1) and toward experimentation (Table 2). Both tables reveal a mild association between behavior in the simulated experiment (ratings on the four dependent variables) and expressed attitudes concerning the social sciences and experimentation. Subjects who expressed a high regard for the social sciences and experimentation tended to give more favorable ratings on the Festinger-Carlsmith dependent variables.

The data in Tables 1 and 2, however, should be interpreted with extreme caution First, the attitude items "explain" only a small portion of the response variance in the Festinger-Carlsmith dependent variables, and these patterns of association are not consistent across all of the comparisons shown in Tables 1 and 2. Second, since the ratings comprising the Festinger-Carlsmith dependent variables bear some similarity to the attitude ratings of the social sciences and experimentation, the two sets of ratings may be partially measuring the same things or they may share a common response-bias component. However, the fact that the observed patterns of association are stronger among the female respondents than among the males militates against such an explanation.

Some of the reactions of the experienced subjects to their last experimental experience were found to be correlated with the responses to the Festinger-Carlsmith simulation. As shown in Table 3, the experienced subjects who expressed the most concern with figuring out the purpose of their last real experiment tended to rate the tasks of the simulated experiment as less enjoyable and less educational than those less concerned with deciphering the experimenter's purpose. In addition, the more "hypothesis-prone" experienced subjects rated the simulated experiment as having greater scientific importance and indicated a stronger desire to participate in a similar experiment (see Table 3). Another structured question concerned with attempts to confirm or foul up the experimenter's hypothesis was also systematically related to the Festinger-Carlsmith ratings. There was a slight tendency for the patterns of association between concern with the experimenter's hypothesis and the performance on the simulated experiment to be higher among the men than among the women.

The slight sex differentiation noted above may be indicative of greater male

Table 1 -- MEAN RATINGS GIVEN IN FESTINGER-CARLSMITH SIMULATION BY RESPONDENT'S SEX AND ATTITUDE TOWARD THE SOCIAL SCIENCES

Festinger-Carlsmith Rating Scale Questions and Respondent's Sex	Respect for the Social Sciences[a/]		
	Low or Moderate	High	Very High
How enjoyable tasks were			
Males	2.83 (N= 6)	3.05 (N=39)	2.53 (N=30)
Females	2.00 (N= 8)	2.71 (N=45)	3.26 (N=54)
How much they learned			
Males	1.83 (N= 6)	1.92 (N=39)	1.76 (N=30)
Females	1.12 (N= 8)	1.78 (N=45)	2.08 (N=53)
Scientific importance			
Males	4.40 (N= 5)	4.69 (N=39)	5.76 (N=29)
Females	3.00 (N= 8)	4.69 (N=45)	4.72 (N=54)
Participate in similar experiment			
Males	4.33 (N= 6)	3.79 (N=38)	4.73 (N=29)
Females	4.00 (N= 8)	4.29 (N=45)	4.50 (N=54)

[a/] The ten response choices (from "very strongly agree" to "very strongly disagree") to the statement that "I have great respect for the social sciences" were collapsed into categories of "very high" respect (score of 9), "high" respect (scores of 7 or 8), and "low or moderate" respect (scores 0 - 6).

Table 2 -- MEAN RATINGS GIVEN IN FESTINGER-CARLSMITH SIMULATION BY RESPONDENT'S SEX AND ATTITUDE TOWARD EXPERIMENTATION

Festinger-Carlsmith Rating Scale Questions and Respondent's Sex	Value of Experimentation as Means of Increasing Knowledge of Human Behavior[a/]		
	Low or Moderate	High	Very High
How enjoyable tasks were			
Males	2.71 (N=17)	2.53 (N=32)	2.89 (N=44)
Females	2.88 (N=26)	2.85 (N=47)	3.00 (N=48)
How much they learned			
Males	1.94 (N=17)	2.09 (N=32)	1.57 (N=44)
Females	2.04 (N=26)	1.62 (N=47)	1.77 (N=47)
Scientific importance			
Males	3.19 (N=16)	5.16 (N=31)	5.15 (N=44)
Females	3.58 (N=26)	4.23 (N=47)	5.23 (N=46)
Participate in similar experiment			
Males	2.29 (N=17)	4.63 (N=30)	4.59 (N=44)
Females	4.24 (N=25)	3.85 (N=47)	4.60 (N=48)

[a/] The ten response choices (from "very strongly agree" to "very strongly disagree") to the statement that "Experiments are not a very important means of increasing our knowledge of human behavior" were collapsed into evaluation categories of "very high" (the strongest disaffirmative rating of 0), "high" (score of 1 or 2), and "low or moderate" (scores 3 - 9).

Table 3 -- MEAN RATINGS GIVEN IN FESTINGER-CARLSMITH SIMULATION BY RESPONDENT'S SEX AND CONCERN WITH FIGURING OUT THE EXPERIMENTER'S HYPOTHESIS

Festinger-Carlsmith Rating Scale Questions and Respondent's Sex	Concern with Figuring out the Experimenter's Hypothesis[a/]		
	Little	Some	Very Much
How enjoyable tasks were			
Males	2.25 (N= 4)	3.35 (N=17)	2.63 (N=19)
Females	5.75 (N= 4)	3.21 (N=19)	2.20 (N=25)
How much they learned			
Males	4.25 (N= 4)	2.18 (N=17)	1.37 (N=19)
Females	3.25 (N= 4)	3.05 (N=19)	0.92 (N=24)
Scientific importance			
Males	2.25 (N= 4)	4.76 (N=17)	5.26 (N=19)
Females	4.25 (N= 4)	4.68 (N=19)	4.60 (N=25)
Participate in similar experiment			
Males	2.50 (N= 4)	3.76 (N=17)	4.05 (N=19)
Females	4.75 (N= 4)	5.11 (N=19)	4.08 (N=25)

[a/] The response choices to the statement that "while I was in the [last] experiment, I was particularly concerned with trying to figure out the experimenter's hypothesis" were collapsed into categories of "little" concern (score of 4), "some" concern (scores 5-7), and "very much" concern (scores 8-9). Twenty-two respondents, who scored 0-3, were inadvertently omitted from this table by a computer programming error which was discovered too late to correct before the deadline for this report.

concern with scientific aspects of experimentation. That is, males may be more likely to define experiments in terms of their scientific purpose while females may tend to focus on the "social" aspects of the ongoing Experimenter-Subject interaction. While such an hypothesis may grossly overstate sex role differentiation in terms of technical versus socioemotional orientation, it does suggest a new tack for further study. A potent feature of the process by which subjects define research situations may be whether or not their general orientations are predominantly scientific.

SUMMARY

The literature on the social psychology of experimental situations is generally rich in ideas but weak in empirically-verified assumptions and hypotheses. The present exploratory study was intended as a step in the direction of constructing empirically-based explanations of the behavior of human subjects. Because of the exploratory nature of the study, the "findings" are too numerous and too tentative to completely review here. Nevertheless, a brief overview of the results is in order.

The classical experimental paradigm with its methodological prescriptions (randomization of subjects, standardized stimulus presentations within experimental conditions, etc.) was developed for work with mineral and animal subjects; it does not adequately cope with the problems which may arise when working with human subjects. Some of these problems were discussed in terms of the five social features of experimental situations identified by Riecken (1962). Although Riecken's ideas and those of other social scientists concerning human subjects received some support from our data, it is clear that human subjects, experimenters, and experimental designs are too diverse to codify by simple models presuming passive, or "good", or "bad" subjects. Subjects, for example, may have <u>both</u> hostile and favorable feelings toward experimentation and the social sciences. Certain features of experiments (e.g., course-required experimental participation, unpleasant experimental tasks, etc.) may trigger "bad subject" motives and behavior, while other (e.g., a well-liked teacher-experimenter) may stimulate "good subject" motives. In any event, the subject is not likely to be a passive responder to the experimental stimuli.

If we were to attempt to summarize, on the basis of our data, the typical experiences and backgrounds of research subjects, the following composite portrait would emerge: The subject is participating to fulfill a course requirement and has had considerable previous exposure to social scientific thought and practice through such channels as social science courses, experienced subjects, and prior experimental experiences. He may also depart from the image of the "naive" subject as he may have received some information about the experiment from an earlier-run subject. On the basis of his previous exposure to social scientific thought and practice and his everyday social experiences, he has formed a definite set of expectancies about the social science experiment. Included in this model are beliefs that experimentation is scientifically worthwhile and will benefit mankind, that serving as an experimental subject is not always an interesting and pleasant experience, that experimenters are persons to be respected and trusted, and that sometimes experimenters should be feared for their "psychological powers" of personality insight. If the events of an actual experiment tend to depart from the subject's preconceived model of the experiment,

various components of subject motivation may be intensified and the subject may exhibit unintended (from the experimenter's standpoint) behaviors such as attempts to decipher and then confirm the experimenter's hypothesis.

III. THE SIMULATED FORCED COMPLIANCE EXPERIMENT: COGNITIVE DISSONANCE OR DEMAND CHARACTERISTICS?

Few experiments in social psychology have aroused the substantive controversies or received the methodological attentions accorded Festinger and Carlsmith's (1959) study of the "Cognitive Consequences of Forced Compliance." Festinger and Carlsmith investigated how a person's private opinions change when he is forced, or more accurately induced, to publicly say something contrary to those opinions. They proposed, on the basis of cognitive dissonance theory, that the larger the reward used to elicit the public statement (beyond the minimum needed to elicit it), the less the individual's cognitive dissonance, and hence the smaller the dissonance reducing change in the individual's private opinions.

To test their hypothesis, Festinger and Carlsmith designed an experiment in which subjects were exposed to an extremely boring laboratory experience and then induced to tell the next subject (in actuality a paid confederate) that their experience had been both interesting and enjoyable. One group of subjects was paid one dollar for lying, one group was paid twenty dollars for lying, and a control group was not asked to lie. Various measures of subjects' private opinions about their experiences were administered after they had lied. Subjects in the one dollar (small reward) condition expressed more favorable opinions about their laboratory experiences than did subjects in the twenty dollar (large reward) and control conditions. Festinger and Carlsmith concluded that their results had strongly corroborated the hypothesis they had derived from cognitive dissonance theory.

CRITICISMS OF FESTINGER AND CARLSMITH'S STUDY

Since 1959, when Festinger and Carlsmith's study appeared, a great deal of effort has gone into critical evaluation of their findings (for example, see Chapanis and Chapanis, 1964; Elms and Janis, 1965; and Janis and Gilmore, 1965). In particular the Festinger and Carlsmith study has provided a significant battleground for continuing controversy between those partial to various reinforcement or "incentive" theories of attitude change and those fond of cognitive consistency theories. The details of the exchange between the dissonance theorists and their critics need not concern us here, but the metholological basis of the dispute is of moment.

Social psychologists of a reinforcement persuasion have maintained, in essence, that a methodological fault in the design of Festinger and Carlsmith's experiment invalidates the dissonance interpretation of their experimental findings (Chapanis and Chapanis, 1964; Janis and Gilmore, 1965). Although stated somewhat differently by different researchers, reinforcement theorists essentially agree that the basic difficulty with Festinger and Carlsmith's experimental design is that data from subjects in their $20 condition may have been systematically biased, i.e., offering subjects the large sum of $20 to lie may make them unusually suspicious of the experiment and/or of the "true" motives of the experimenter (Rosenberg, 1965).

THE SOCIAL PSYCHOLOGY OF EXPERIMENTAL SITUATIONS

While the experimental evidence for the foregoing speculation must be considered ambiguous at the present time, the social psychological perspective at its base

remains provocative (for an excellent defense of the Festinger and Carlsmith experiment, see Aronson, 1966). Experimentally minded researchers have, in recent years, become increasingly concerned with the methodological implications of the fact that conducting an experiment with human subjects necessarily involves experimenter and subject in a system of social interaction with each other, no matter how circumscribed. Rosenthal (1964) and Sarason (Sarason and Minard, 1963), among others, have shown that an experimenter, in interacting with his subjects, is likely to inadvertantly reveal to them certain of his expectancies for their behavior in relation to the dependent variable. Orne (1962), focusing on the social role of the experimental subject, has suggested that experimental subjects are likely to be acutely attentive to the subtle, unprogrammed features of any experimental situation, especially those which might convey the experimental hypothesis. Orne has called such cues "demand characteristics" and has suggested that because experimental subjects in our culture are motivated to play the role of the "good subject," they will behave in a manner designed to validate the experimental hypothesis as they see it.

When seen within the perspective of the social psychology of experimental situations, previous studies of forced compliance by both dissonance theorists and their critics appear deficient in two major respects. First, none of these studies have systematically controlled for or measured the effects of variables associated with the experimenter. It is thus conceivable that the findings of previous experiments have been functions of either (1) the idiosyncrasies of the experimenters who ran them or (2) the cues about the experimental hypothesis the experimenters unwittingly "gave off." Second, previous studies have not been designed to investigate the effects of demand characteristics per se. As Orne has pointed out, demand characteristics are defined by all the unprogrammed cues in an experimental situation; any attempt to study the effects of demand characteristics must preserve these cues in their totality.

The present paper reports an attempt to study the effects of the demand characteristics present in Festinger and Carlsmith's experimental conditions. The experimental design employed provided for the control of experimenter effects.

METHOD

Experimental Design

Any attempt to study the demand characteristics of experimental situations necessarily involves the use of an unorthodox experimental design. The basic question of interest in such a study is, "Does the experimental situation contain a combination of unrecognized cues ("demand characteristics") to which subjects are responding in such a way so as to produce the pattern of experimental findings or is the independent variable specified by the experimenter truly responsible for that pattern?" The design of the present study illustrates one way in which an answer to this question may be courted.

Following a suggestion by Orne, subjects in the present experiment were asked to read a very detailed verbal description of everything they would have experienced had they been real subjects in one of Festinger and Carlsmith's experimental conditions. Then, under instructions to respond as if they had actually undergone these experiences, subjects were measured on the same dependent variables as were Festinger and Carlsmith's subjects. In other words subjects in the present study were exposed to all features present in Festinger and Carlsmith's experimental

conditions, but only in their imaginations. They did not undergo a boring laboratory experience for an hour, nor did they get paid for lying about it, i.e., compared to the "strong" manipulation of the independent variable in Festinger and Carlsmith's experiment, the present study included only a very "weak" manipulation. Thus, relative to findings from Festinger and Carlsmith's study, experimental findings from the present study should be especially reflective of the demand characteristics inherent in the experimental conditions. The extent to which Festinger and Carlsmith's results were a function of demand characteristics may thus be reasonably inferred by comparing their findings with those of the present study.

One other feature of the design of the present study deserves special comment. To control for experimenter effects both subjects and experimenters were randomly assigned to experimental conditions. Experimenters were informed neither of the purpose of the experiment nor of the various experimental treatments it involved. Further the authors were themselves ignorant of which experimenters had been assigned to which conditions.

Procedure

Eighty upper division students enrolled in a course in methods of social research completed interviews with a random sample of University of California Santa Barbara undergraduate students. The "simulation" of Festinger and Carlsmith's study was part of the interview schedule. The simulation was achieved by having each respondent read a detailed description of one of the three experimental conditions used by Festinger and Carlsmith. Respondents were told that when they read the descriptions they were to imagine that they were actually experiencing what was described. The descriptions they read are reproduced in Appendix B. It should be mentioned that every attempt was made to make them faithful to Festinger and Carlsmith's actual procedure, even to the extent of using the same cover story that Festinger and Carlsmith used in order to achieve measurement of their dependent variables.

RESULTS

The first question which should be asked of data gathered in the present experiment is whether it is true, as critics of Festinger and Carlsmith's study have argued, that subjects who are paid $20 to lie are likely to be relatively more suspicious of the experiment than subjects who are paid $1 to lie. After subjects in the present experiment had completed their experimental experiences, they were asked the following question:

> From the time you arrived for the experiment until the time you left, including everything you did while in the building, did you become suspicious of anything that went on or anything the experimenter said or did?

Examination of Table 1 shows that although most subjects in the present study indicated that they were suspicious, subjects in the $20 condition were no more likely to be suspicious than were subjects in the $1 condition. It is true that subjects in the control condition are slightly less likely to express suspicion than are subjects in the experimental conditions, but this finding has no direct bearing on Festinger and Carlsmith's interpretation of their data.

TABLE 1 -- PROPORTION OF SUBJECTS SUSPICIOUS OF THE EXPERIMENT, BY EXPERIMENTAL GROUP AND BY SEX

Suspicion[a] by Sex	Experimental Conditions		
	Control (1)	One Dollar (2)	Twenty Dollars (3)
Suspicious Males	68%	85%	84%
(number of males)	(34)	(27)	(32)
Suspicious Females	62%	80%	82%
(number of females)	(34)	(49)	(38)

[a] Based on responses to the following question: "From the time you arrived for the experiment until the time you left, including everything you did while in the building, did you become suspicious of anything that went on or anything the experimenter said or did?"

We now may turn to examination of the main findings of the present experiment. Since the purpose of the present study was to simulate in great detail Festinger and Carlsmith's experimental procedure, we will follow the same strategy in presenting our findings. Thus we have employed, as nearly as could be determined, the same statistical tests as did Festinger and Carlsmith. Futher, we will examine the results for male and female subjects separately since male subjects only were used by Festinger and Carlsmith. And finally, we have discarded data from certain subjects on the same basis that Festinger and Carlsmith indicated that they had discarded data from certain subjects, i.e., if a subject indicated that he was suspicious because he was being paid to lie, his data were not included in the analysis. On this basis, 6 subjects were dropped from the $1 condition and 11 from the $20 condition.

Means from Festinger and Carlsmith's experiment are reproduced in Table 2. The major results of the present experiment, for the sample of subjects corresponding to Festinger and Carlsmith's sample, are summarized in Table 3 which lists, by condition, subjects' average responses to each of the four rating scales employed in both Festinger and Carlsmith's experiment and in the present experiment. Note first subjects' average ratings of how enjoyable the experimental tasks were. Although subjects in all conditions were of the opinion that the experimental tasks were not very enjoyable, subjects in the low reward ($1) condition were significantly more positive in their ratings of the experimental tasks than were subjects in the control condition or in the $20 condition. This pattern of findings exactly parallels the pattern found by Festinger and Carlsmith (although absolute magnitudes are lower) and was the pattern they considered crucial to support of the dissonance hypothesis. Ratings on this scale are most directly relevant to the specific dissonance which was experimentally created.

Noting next the pattern of ratings subjects gave to the question, "How much did you learn from the experiment?", we observe that no statistically significant differences emerge. Again Festinger and Carlsmith found the same and reported that this too was in line with their hypothesis. They argued that responses to this question could not serve to reduce dissonance since the question had nothing to do with the dissonance that was experimentally created, i.e., the dissonance caused by saying one enjoyed the experiment when one in fact did not.

In regard to subjects' average ratings on the questions, "How scientifically important was this experiment?", and "How much desire do you have to participate in another similar experiment?", Festinger and Carlsmith expected that the pattern of findings would be very similar in each case to the pattern on "how enjoyable the tasks were". They reasoned that responses to each of these questions could serve to reduce dissonance, although not so directly as responses to the first question. In fact Festinger and Carlsmith found what they expected and, as can be seen in Table 3, our findings again are very similar to Festinger and Carlsmith's.

In summary, then, it may be said that for a sample of males comparable to Festinger and Carlsmith's, the patterns of findings from the present study are in all cases remarkably similar to the patterns of findings Festinger and Carlsmith reported. Since findings from the present study should have been even more reflective of demand characteristics (relative to the independent variable) than were findings from Festinger and Carlsmith's study, it seems reasonable to believe that it is likely that the demand characteristics inherent in Festinger and Carlsmith's experimental conditions were responsible for their results.

Table 2 -- MEAN RATINGS ON INTERVIEW QUESTIONS REPORTED BY FESTINGER AND CARLSMITH [a]

Questions on Interview [b]	Experimental Condition		
	Control (N = 20)	One Dollar (N = 20)	Twenty Dollars (N = 20)
How enjoyable tasks were	4.55	6.35	4.95
How much they learned	3.08	2.80	3.15
Scientific importance	5.60	6.45	5.18
Participate in similar experiment	4.38	6.20	4.75

[a] Source: Festinger and Carlsmith, op. cit., Table 1.

[b] The above scales range from 0 (most negative) to 10 (most positive). A constant (+5) was added to the -5 to +5 ratings for clarity of presentation.

Table 3 -- MEAN RATINGS (AND STANDARD DEVIATIONS) ON INTERVIEW QUESTIONS, FOR MEN: WUEBBEN-STRAITS SIMULATION

Questions on Interview [c]	Experimental Conditions			Significance of Comparisons [a] ($p < .05$)
	Control (1) (N = 34)	One Dollar (2) (N = 23)	Twenty Dollars (3) (N = 25)	
How enjoyable tasks were	2.35 (1.94)	3.65 (2.39)	2.24 (2.30	t (1 vs 2) = 2.22 t (2 vs 3) = 2.04 t (1 vs 3) = N.S.
How much they learned	1.32 (1.53)	2.17 (1.69)	1.92 (1.70)	t (1 vs 2) = N.S. t (2 vs 3) = N.S. t (1 vs 3) = N.S.
Scientific Importance	4.79 (2.84)	6.04 (2.10)	4.37 [b] (2.56)	t (1 vs 2) = N.S. t (2 vs 3) = 2.40 t (1 vs 3) = N.S.
Participate in similar experiment	2.97 [b] (2.81)	5.00 (2.78)	4.33 [b] (3.00)	t (1 vs 2) = 2.62 t (2 vs 3) = N.S. t (1 vs 3) = N.S.

[a] The significance tests are 2-tailed (as used by Festinger and Carlsmith) employing the computational formulas given by H.H. Blalock (Social Statistics, McGraw-Hill, 1960, pp. 172-176) for the t statistic difference-of means tests for unknown but equal variances (model 1) and for unknown but unequal variances (model 2). Model 2 was employed if the hypothesis of equal variances using a F test was rejected.

[b] The number of subjects answering this question is one less than the total number in the experimental condition.

[c] The above scales range from 0 (most negative) to 10 (most positive).

Turning now to the female sample, it may be seen in Table 4 that no statistically significant findings are present and that, further, the patterns of findings shows no correspondence to the pattern found for males. (Again it may be recalled that Festinger and Carlsmith used only males in their experiment.) Thus unless dissonance theory is applicable only to males--a conclusion which would seem unacceptable to its proponents--data from the female sample would seem to reinforce the conclusion that demand characteristics are indeed important in accounting for the present set of findings. While the nonsignificance of the results for females remains puzzling, it is a problem which cannot be approached within the context of a comparison between Festinger and Carlsmith's experiment and the present study.

Table 4 -- MEAN RATINGS (AND STANDARD DEVIATIONS) ON INTERVIEW QUESTIONS, FOR WOMEN: WUEBBEN-STRAITS SIMULATION

Questions on Interview [c]	Experimental Conditions			Significance of Comparisons [a] (p<.05)
	Control (1) (N = 34)	One Dollar (2) (N = 47)	Twenty Dollars (3) (N = 34)	
How enjoyable tasks were	3.12 (2.37)	3.06 (2.56)	2.62 (2.28)	t (1 vs 2) = N.S. t (2 vs 3) = N.S. t (1 vs 3) = N.S.
How much they learned	1.88 (2.39)	1.55 (2.08)	2.06[b] (2.28)	t (1 vs 2) = N.S. t (2 vs 3) = N.S. t (1 vs 3) = N.S.
Scientific Importance	4.68 (2.75)	4.19[b] (2.53)	4.64[b] (2.92)	t (1 vs 2) = N.S. t (2 vs 3) = N.S. t (1 vs 3) = N.S.
Particpate in similar experiment	3.81[b] (2.65)	4.19 (3.11)	4.68 (3.06)	t (1 vs 2) = N.S. t (2 vs 3) = N.S. t (1 vs 3) = N.S.

[a] The significance tests are described in the first footnote to Table 3.

[b] The number of subjects answering this question is one less than the total number in the experimental condition.

[c] The above scales range from 0 (most negative) to 10 (most positive).

IV. THE REAL EXPERIMENT: CONFESSION OF PRIOR KNOWLEDGE ABOUT EXPERIMENTAL PROCEDURES AS A FUNCTION OF EVALUATION APPREHENSION AND COMMITMENT

A recent issue in social psychology is the extent to which subjects who have prior knowledge about the true purpose of a deception experiment will reveal that "illicit information" (Denner, 1967) to experimental personnel. This topic is of importance since deception is essential for the study of certain subject matters in social psychology. In the basic Asch conformity design, for example, it is usual to tell the subjects they are taking part in some sort of perception study; to tell them the truth, that the study is concerned with their conformity to group pressure, would undermine the study (Aronson and Carlsmith, 1968). Indeed, it is probably the case in most experiments that subjects must be ignorant of the experimenter's hypothesis. Thus, subjects are usually given a false cover story before the experiment proper begins. But ethical considerations require that they be debriefed after they have participated, i.e. informed of the true purpose of the experiment and the nature of the deception that was practiced on them. Subjects are then typically asked not to tell anyone about the experiment.

Experimenters who use deception are therefore clearly vulnerable. Debriefed and informed subjects may break their pledge to secrecy and talk to others (Wuebben, 1969). If these others become subjects in the same experiment, the requirement of naivete is not met. Further, these informed subjects may not admit their knowledge. If it were the case that informed subjects always admitted their prior knowledge then the problem would be trivial; the experimenter could simply cull the data on these subjects. Recent research shows however that subjects who possess illicit information typically do not divulge it to experimental personnel.

The fact that subjects lie to experimenters is undergoing the usual transformation from being a mere technical hindrance to being a substantive topic in its own right (McGuire, 1969). Clearly, lying is an important social phenomenon, with great significance not only for many different kinds of research methods but for all interpersonal relations. This experiment was designed to test two hypotheses relevant to subjects' lying about prior information. First, high evaluation apprehension (anxiety) will lead to more lying. Second, high commitment to an experiment will lead to more lying. Before discussing these hypotheses in detail, we turn to a review of the relevant literature.

THE LITERATURE

Levy (1967) introduced the basic design in this field. Its essential features are that the experimenter arranges for the subjects to come into contact with his confederate, who tells them, in some detail, about the experiment in which they are about to take part. After the experiment, the subject is interviewed and asked if he had any prior knowledge about the experiment. In Levy's experiment, a male confederate fully informed half of the subjects about the Taffel Test (a verbal conditioning task, Taffel, 1955) they were about to engage in. None of the informed subjects voluntarily admitted their illicit information before

or during the experiment. Though Levy was primarily interested in the effect of the subjects' awareness of the reinforcement contingency, he also asked the subjects if they knew anything about the experiment before they participated in it. Of 16 fully informed subjects, one admitted full prior knowledge and three admitted partial knowledge.

Several factors seem to have operated to produce this very low admission rate. Levy's experimenter was an attractive female graduate student "whose physical endowments and manner were such as to leave little doubt as to her ability to elicit beneficence from the typical male undergraduate" (Levy, 1967). The subjects were, of course, male undergraduates. The confederates script mentioned that the experimenter was probably worried about getting the right results since the experiment was for her doctoral dissertation. The female post-experimental interviewer used the 12 item post-conditioning interview for awareness devised by Spielberger and Levin (1962), followed by a single question asking if the subject had any prior information.

Thus Levy's design resulted in a condition in which (a) subjects had been induced by the beneficence manipulation to wish to help the experimenter and (b) concealing prior information could be seen as being helpful. This condition was combined with a post-experimental interview consisting of a single question on prior information. This sort of situation in which experimenter and subject combine to keep hidden any information which might be damaging to the experiment has been called a "pact of ignorance" by Martin Orne (1962). In Levy's experiment, the pact of ignorance lead to a concealment rate of 75%.

Levy's design has been extended by several researchers. Though various elements have been systematically altered, the basic effect, subjects' unwillingness to report illicit information, has been consistently found. Denner (1967) retained the Taffel Test experimental task together with the Spielberger and Levin awareness questionnaire, but he used a greatly extended procedure to elicit confessions of prior information. Denner was interested in the differential effect of three kinds of informers (confederates) on the subjects' experimental and post-experimental behavior. His confederates all imparted the same information to the subjects, but the perceived motivation for their behavior differed. In the Wheelerdealer condition, the confederate tried to get the subject to do him a favor in return for the information. In the Good Joe condition, the confederate appeared to be merely trying to help the subject get through the experiment quickly. In the Nonchalant condition, the confederate gave no rationale for his action. After the experiment, subjects were asked four questions:

(1) How did you find the experiment? Did anything seem unusual?
(2) By the way, did you see anybody in the waiting room before the experiment?
(3) Did you happen to talk to anyone in the waiting room before we began?
(4) Say, by chance did you receive information that helped you in the study?

These questions were followed by a direct statement:
(5) The young man you spoke to before the experiment proper was my assistant. He told you what pronouns to use and--depending on the condition--he made a deal with you or acted like a nice guy.

Subjects were given a confession score corresponding to the question on which they confessed. If a subject denied having been spoken to even after having been

debriefed (some subjects did), he received a score of six. The mean scores for the Nonchalant, Good-Joe, and Wheeler Dealer groups respectively were 3.4, 3.2, and 5.6. Eventually, after having been introduced to the confederate, all subjects confessed that they had been given information which they could use to get through the experiment more quickly.

In Denner's design there was no deliberate inducement to beneficence toward the experimenter and clearly there was no "pact of ignorance" in the post-experimental interview, yet even the lowest mean score of 3.2 indicates an attempt on the part of the subjects to conceal their illicit information under direct and explicit questioning. The highest mean score, 5.6, reflects great tenacity in refusing to confess. As with Levy's study, no subject volunteered that he had been informed.

Lichtenstein (1968) also modified Levy's basic design. He used male and female subjects with two different experimental teams composed of confederate, experimenter and post-experimental interviewer. Lichtenstein's study had a control group and two experimental groups. In one experimental group, subjects were informed by a confederate whose speech was identical to that used by Levy's informer. The second experimental group heard the same speech except that the last sentence of Levy's informer's speech, "Better not say that I told you about it," was omitted. Lichtenstein used the same verbal conditioning task as Levy. The post-experimental interview differed from Levy's, being similar to the Spielberger and Levin awareness questionnaire except for having only six items, the first of which was identical to the last question asked by Levy, "Did you know anything about this experiment before you participated in it?" The change in position of the question, from last item to first item, is important in that it provides an immediate opportunity for informed subjects to confess their illicit information. In the Levy experiment, subjects who had concealed their prior information while answering their last questions on awareness might have felt "locked" into a concealment strategy.

Lichtenstein's questions 2 through 5 were concerned with awareness of conditioning. His sixth question was, "Did you hear anything about the experiment from anyone who had been a subject earlier?" Lichtenstein found no differences between (a) male and female subjects, (b) the two experimenter teams, or (c) the two experimenter groups. Four of the 34 informed subjects confessed having full prior information. Thirteen subjects acknowledged partial information. Question one elicited two full information confessions and four partial information admissions. Question six (the second question that was concerned with prior knowledge) picked up one full confession and an additional eight partial confessions. Thus Lichtenstein's addition of an extra question regarding prior knowledge improved the confession rate over that obtained by Levy from 6% to 12% for full admission and from 25% to 50% for at least partial admission. Again, no subject voluntarily admitted having any prior information at any point in Lichtenstein's experiment. The lack of differences between the experimental groups presumably indicates that expressed requests for silence by an informer has no effect.

The next study to be reviewed is that of Golding and Lichtenstein (1970) who used all male subjects and experimental personnel. The experimental task involved the Valins Bogus heart rate procedure (Valins, 1966) instead of the Taffel test. A confederate imparted differential amounts of information to three experimental groups to produce Naive, Suspicious and Informed groups of subjects. The characteristics of the post-experimental interview were also manipulated. The first

condition, the Pact of Ignorance condition, was similar in tone to Levy's; the interviewer and subject in effect cooperated to conceal information damaging to the experiment. In the second condition, the Scientific Integrity condition, the interviewer made completely explicit his strong desire to be told about any "irregularities" in the experimental procedures. The same 13 item awareness/suspicion/prior information questionnaire was administered to all subjects.

Again, focussing on the confession rate of fully informed subjects, the informed experimental group had a substantially higher rate of admission in the Scientific Integrity condition. According to the authors' scale, 10% of the Informed group admitted full information, while 50% admitted partial information. The Scientific Integrity condition accounted for both of the full admissions and 6 of the 10 partial admissions. Once again, there were no <u>voluntary</u> admissions by the informed subjects.

These various studies have shown the stability of the phenomenon of subjects' refusing to admit prior knowledge. The manner of informing, the sex of the subjects and of the experimenters, the nature of the experimental task, and the rigor of the post-experimental interview have all been varied yet the subjects have behaved rather uniformly--none of them has voluntarily confessed, most confessed very little and a sizeable group denied any prior knowledge. The following table summarizes the data:

	Levy	Lichtenstein	Lichtenstein and Golding
Full confession	6%	11%	10%
Partial confession	19%	39%	50%
Denial	75%	50%	40%
	100 (N=16)	100 (N=34)	100 (N=20)

From the table we can see the trend toward improved admission rates. However, even the best of these rates still shows 40% of the informed subjects denying having <u>any</u> prior knowledge. In the case of Denner's experiment, all the subjects eventually confessed, but only because the experimenter demonstrated quite unequivocally that he knew they were concealing information from him.

The implications of these studies are clear. Researchers who use designs which rely on the ignorance of the subjects <u>cannot assume</u> that informed subjects will admit their prior information. Increased rigor of questioning does improve confession rates, but unfortunately, not to the point that a researcher can know which of his subjects might have received prior information. Post-experimental interviews may, of course, be made still more rigorous. But at some point, the researcher runs the risk of making his post experimental interviews so demanding that <u>false</u> confessions may be elicited. What is needed is a method or set of methods for maximizing the incidence of true confession while simultaneously minimizing the incidence of false confessions. In this experiment we introduce several features designed to accomplish this task.

HYPOTHESES

This experiment was designed to increase our knowledge of the factors influencing confession rates. Two hypotheses were tested, one derived from cognitive consistency theory, the other from Rosenberg's work on the effects of evaluation apprehension (Rosenberg, 1965). Evaluation apprehension is defined by Rosenberg as "an anxiety toned concern on the part of a subject to be judged by an experimenter as psychologically normal or healthy." Rosenberg has shown that if evaluation apprehension is aroused, it can systematically bias the responses of experimental subjects by interacting with the experimenter's intended manipulation. The type of experiment which is most likely to arouse evaluation apprehension in subjects is that which is clearly clinical in content. Rosenberg and his associates (Duncan et. al, 1969) have shown that when evaluation apprehension was deliberately varied by experimental manipulation, subjects in the high evaluation apprehension condition were much more responsive to paralinguistic cues in the experimenter's speech. That is, the high evaluation apprehension subjects seemed to be especially active in seeking and using any information that could help them in producing the "correct" response, i.e., the response which unequivocally demonstrated their normality, maturity etc. to the omniscient clinician-researcher. The interesting question from our point of view is, how would a subject behave who "accidentally" acquired this kind of useful information before he took part in an experiment?

Rosenberg (1969)suggests two main strategies open to subjects who experience high evaluation apprehension. They can attempt to discover what the "normal" response is, and then produce it, thereby showing the experimenter that they are normal or (2) they can reduce their anxiety by convincing themselves that the clinician-experimenter's judgments are of no concern to them. They may do this repudiating the efficacy of psychological research in general, or by questioning the competence of the particular researcher with whom they are in contact. Since most subjects do not possess the skills needed to assess a clinical researcher, and because of the general high regard that student subjects have for scientific research, the usual response to evaluation apprehension is the search for the right response. Hence, one may expect that when a subject acquires illicit information about an experiment, he will conceal that information and will use it in generating appropriate responses. Furthermore, if he is interviewed after the experiment, we would expect him to continue to conceal his prior knowledge--for to reveal it would be to admit to having concealed it and to having used it in the experiment, and admission of having manufactured a false front. Our hypothesis follows directly from this line of argument. We hypothesize that the more evaluation apprehension a subject feels, the less likely he is to confess prior knowledge. To test this hypothesis, we experimentally manipulated the extent to which the experiment appeared to involve psychological evaluations of the subject's personality.

Our second independent variable is the extent to which the subject "commits" himself to the experiment. Commitment is a variable that may be regarded as central to dissonance theory (Abelson, et. al., 1968: 437). A number of dissonance related experiments have shown that the more effort an individual expends on a project, the more highly he will value the project. As Abelson, et. al. put it (1968: 437), "The experiments on effort and initiation implicitly involve commitment--commitment to the proposition that the pot of gold at the end of this endeavor is worth the price paid in effort." Similarly, we reason that subjects who know they are to participate in two experimental sessions (high commitment) are more likely to want their contribution to the experiment to be valuable (i.e. not culled) than those who expect to participate only once (low commitment). Hence they are less likely to confess to their possession of prior information.

A number of changes from Levy's basic design have been made in this experiment. Because these changes are common to all conditions they are not treated as independent variables. Rather they were intended to raise the confession rate across all conditions. These changes will be discussed below.

METHOD

The subjects were 98 male students enrolled in the introductory course in sociology at the University of California at Santa Barbara. When a subject entered the laboratory waiting-room, he found the experimenter's confederate (C1) sitting there. C1 always asked if the subject knew what the experiment was about. After a few moments another "subject" (C2) was led into the waiting-room by the experimenter (E) and asked to wait because the post-experimental interviewer (PI) "must have stepped out for a moment." After E left, C1 and C2, who appeared to be old friends, exchanged greetings and C2 then told C1 and,"incidentally" the subject, all about the experiment he had just taken part in, including the substance of the debriefing. This conversation was tape recorded and monitored by E. When C2 had finished his speech, PI went into the waiting-room and led C2 out ostensibly for his post-experimental interview. E asked the subject to fill out a Marlowe-Crowne Social Desirability Scale (Marlowe and Crowne, 1964) and then left with C1 presumably for his turn in the experiment. After the subject had completed the form, E took him to another room in which the "experiment" was conducted. The subject was exposed to a three-foot by five-foot board on which were mounted eight pictures. Four had violent content, four had non-violent content. A TV camera lens was fixed through the center of the board. The subject was told that E was studying hand and eye co-ordination and that he was to point and look at all the pictures at least once and then look at any that he chose for a period of 30 seconds, his pointing and looking would be recorded on videotape. After the subject had finished he filled out a brief form asking his preferences in picture content and asking which picture he felt he looked at the longest time. The subject was then given one of four debriefings, depending on which condition he was in. In the high evaluation apprehension conditions, E informed the subject that he was a clinical psychologist and that he was "really" studying what he called the "ostrich effect", namely, the tendency for maladjusted persons to avoid unpleasant features of their environment. He said he would be correlating the subjects' score on the "Personality Adjustment Inventory" (the Marlowe-Crowne S.D. Scale) with his viewing preferences as recorded by the video camera. He apologized for the deception but explained it was necessary in order to obtain unbiased behavior. He emphasized the importance of subject naivete, and asked the subject not to tell anyone about his experience in the experiment.

In the low evaluation apprehension conditions, E's debriefing ran as follows: he was a sociologist; he was studying the relationship between the amount of violence in a culture and the viewing preference of persons raised in that culture. His study, cross-cultural in scope, was seeking to answer the question, "Does being raised in a violent society cause persons to tend to prefer violent to non-violent pictures?" The Attitude Inventory (American), (which was the "Personal Adjustment Inventory" with a different front page) was providing E with additional information. E's speech regarding the necessity of deception and of naivete was the same for both evaluation apprehension conditions, as was his request for silence.

In the high commitment conditions, E told the subject that it might be necessary for him to return in a few day's time for an additional session; he secured the subject's agreement to attend if necessary. In the low commitment conditions, nothing was said about attending another experimental session.

In addition to 87 subjects in the four experimental conditions, 11 control subjects were run. The control subjects were given no relevant information by C2. Rather, they entered the waiting room and were engaged in a conversation (not connected with the experiment) with C1 until he left with E. They then proceeded through the experiment in the same way as the experimental subjects.

It should be recalled that each experimental subject heard C2 tell C1 all about the experiment in considerable detail, including the nature of the deception and the content of E's debriefing speech.

After completing the debriefing, the experimenter brought the subject to a cubicle where he was interviewed by PI. The interview consisted of five questions. The first question asked the subject to relate any thoughts or feelings he had about the study. The second asked if this was the first experiment the subject had participated in. Questions 3, 4, and 5 asked directly if the subject knew anything about the experiment before he looked at the pictures, if he had heard anyone talking about the experiment before he spoke to the experimenter, and finally, if he had heard anyone say anything at any time about the experiment. The interview was tape-recorded.

Unique Aspects of the Experimental Design

Some brief comments should be made about certain aspects of the design that departed from Levy's basic paradigm. Most of these changes were designed to increase the rate of confession. First, though none of the studies discussed above mentioned any suspicion on the part of the subjects, it seemed plausible that some subjects might be made suspicious by a laboratory experiment which allowed two subjects to sit together, and in which the veteran subject immediately described the experiment to the prospective subject. We allayed this suspicion by having it appear that C2 was supposed to be seeing PI, but that PI was temporarily missing. Further, because C2 and C1 were friends, they could quite naturally start talking, and their conversation could rapidily turn to the topic of the experiment.

Second, we increased the perceived social relevance of the experimenter's research. In much psychological research, the experimenter's interest is not shared by the subject. College undergraduates typically are not very interested in such topics as verbal conditioning, stereovision, perception, serial learning, and the like. By contrast, many of our subjects expressed interest in our "study of violence", and hoped that something would come of it. They therefore wanted the research to be successful; many subjects suggested ways to improve the design. To the extent that subjects were convinced that confessing their prior information would improve the study, the social relevance of the topic of violence and their desire that the study be effective should have increased the probability that they would confess.

A further important difference in this study was the feature of having the debriefing precede the post-experimental interview. Of course, the usual practice is

to have the debriefing as the final item in the experiment. In our design, the experimenter explained what he was studying, apologized for his deception and emphasized the crucial importance of subject naivete to the validity of his study. This was immediately followed by PI's question as to whether or not the subject had heard anything about the experiment. These factors probably resulted in strong scientific integrity motivation (Golding and Lichtenstein,1970).

There were other novel features of the design. First, having C1 ask the subject if he knew what the experiment was about provided for a check on the efficacy of the experimenter's request for silence, i.e. if earlier-run subjects had talked, later-run subjects may have known about the experiment. Second, asking in the post-experimental interview if the subject had participated in other experiments permits for an analysis of confession rate in terms of prior experimental experience. Finally, the phrasing of the interview questions was carefully designed to avoid certain equivocations by the subjects. If a subject is asked as is the usual practice, "Did you know anything about this experiment before you participated in it?", the subject can (more or less truthfully) answer negatively despite having heard a great deal, if he defines his participation as having begun, say, when he entered the laboratory. Using the phrase, "before you saw the pictures," restricts this definitional ambiguity.

RESULTS

Confession Rates

The responses of the subjects to the questions asked in the course of the post-experimental interview are shown in Table 1. A Nil code indicates that the subject confesses nothing.. A Trivial code applies to those subjects who admit hearing some one talk about the experiment prior to their participation, but admit only to hearing details which Dr. King himself told them in his pre-experimental explanatory remarks. A code of Partial is given those subjects who admit hearing someone talk about the experiment, and who admit to having heard any of the content of Dr. King's post-experimental debriefing speech prior to their participation. Finally, a code of Full is given to those who admitted knowing everything about the experiment before they took part in it.

The control group subjects, who were informed, did not confess anything. This is an important finding in that it shows that our post-experimental inquiry procedure did not place undue demands on the subjects for false confessions. As the findings in Table 1 indicate, the confession rate we obtained from experimental subjects was an improvement over the confession rates obtained by other researchers. The proportion of subjects denying any prior knowledge has improved from Levy's finding of 75%, through Lichtenstein's 50% and Lichtenstein and Golding's 40% to our 14%. Thus our study demonstrates that it is possible to reduce greatly the incidence of lying in post-experimental interviews, while at the same time avoiding the problem of false confessions.

TABLE 1

AMOUNT CONFESSED IN POST-EXPERIMENTAL INTERVIEW

Amount Confessed	Experimental Groups	Control Groups
Full	31%	--
Partial	34	--
Trivial	21	--
Nil	14	100%
Total	100%	100%
N=	(87)	(11)

Experimental Variables

We now turn to a more detailed analysis of the results. There were four experimental conditions. Each independent variable had two values, high and low, these being factored in a 2x2 design to produce the four conditions shown in Table 2.

TABLE 2

PERCENT HONEST BY EVALUATION APPREHENSION AND COMMITMENT

Commitment	Evaluation Apprehension		Total
	High	Low	
High	59% (N=22)	50% (N=22)	55% (N=44)
Low	91% (N=22)	62% (N=21)	77% (N=43)
Total	75% (N=44)	56% (N=43)	66% (N=87)

We have collapsed the Nil and Trivial groups into a single group labeled Dishonest while the Partial and Full groups are combined to form an Honest group. The rationale for this procedure is quite straightforward. In most experiments, the subjects in our Dishonest group would not have been disqualified from the experiment on the basis of their reports of what they knew, whereas subjects in the Honest group would probably have been withdrawn on the basis of what they reported.

It is evident from Table 2, which shows the proportion of honest subjects in each experimental condition, that the experimental manipulations affected subjects' behavior. As hypothesized, the effect of high commitment is to decrease the honesty of subjects. Contrary to our other hypothesis, the high evaluation apprehension manipulation acted to increase the honesty of subjects.

To assess the probabilities that these results could have occurred by chance, an unweighted two-way analysis of variance for unequal cell frequencies (Winer, 1962: 241-244) was performed. Although our dichotomous (honest-dishonest) dependent variable violates the normality and homocedasticity assumptions of analysis of variance, there is evidence that this statistical procedure appears to be fairly robust under the conditions found in our data (Lunney, 1970). Table 3 presents the results of the analysis of variance. Although there was no interaction between the two experimental factors, each factor independently made a contribution. Commitment was significant at the .05 level and evaluation apprehension fell just short of this level. Thus the probability is small, about .05, that these findings occured by chance. Additional evidence supporting a non-chance interpretation of the results is presented next.

TABLE 3

TWO-WAY ANALYSIS OF VARIANCE OF DICHOTOMOUS CONFESSION MEASURE

Source	df	MS	F*
Commitment	1	1.0380	4.90**
Evaluation Apprehension	1	0.7899	3.73***
Interaction	1	0.2132	
Within Cell	83	0.2119	

*Error and interaction terms pooled
** $p < .05$
*** $p < .10$

Since we hypothesized that high evaluation apprehension would reduce honesty, and our results show that it increased honesty, it may be that our manipulation did not have the intended effect of raising the subject's evaluation apprehension. An independent check on the effect of this independent variable, however, shows that the high evaluation apprehension manipulation did alter the subject's behavior in the way intended. After our subjects had finished looking at and pointing at the the pictures, but before they were debriefed by "Dr. King", they filled out a form which asked them (1) which picture they looked at the longest time, (2) which picture they liked the most, (3) which picture they looked at the shortest time, and (4) which picture they liked the least.

For the subjects in the high evaluation apprehension condition, there should have been a clear tendency to claim to prefer unpleasant pictures. This is because the confederate had told them that maladjusted persons avoid unpleasant pictures. Thus if they wanted to appear well adjusted, they should have chosen one of the pictures with violent content. There is no such pressure on subjects in the low evaluation apprehension condition, so they should have been less likely to select a violent picture in answer to our first question.

In answer to the question about the picture looked at the longest, the high evaluation apprehension subjects were indeed more likely to name a violent picture (47% as opposed to 21% of the low evaluation apprehension subjects, chi-square = 5.20, $p < .025$). The same effect is seen in the answers to the other questions.

Two other pieces of evidence support the contention that the evaluation apprehension manipulation was efficacious. Post-experimental interviews were tape-recorded and then coded. One of the codes dealt with criticism of the experiment. Of 36 subjects who expressed some criticism in the course of the five-question interview, some offered constructive criticism by pointing out various ways to improve the study, while other subjects expressed negative criticism of Dr. King's study, saying that it would not prove anything, etc. Subjects in the high evaluation apprehension condition offered twice as much negative criticism as those in the low evaluation apprehension condition (58% as against 29%, chi-square = 2.95, $p < .10$). One way to reduce apprehension about being evaluated is, of course, to denigrate the evaluation situation.

We also coded any mention by the subjects of the biasing effects of hearing about the experiment beforehand. Subjects in the high evaluation apprehension condition were more likely to express concern about the validity of their performance on the fake experimental task (50% as against 32% of low evaluation apprehension subjects, chi-square = 2.73, $p < .10$). This relationship also appeared in the conversations which occured after the formal interview. After the last question had been answered, the post-experimental interviewer asked if the subjects had any questions. Not all the subjects wanted to prolong the conversation, but of the 58 who did, the high evaluation apprehension subjects were again disproportionately concerned about the issue of validity (27% as against 11%, chi-square = 2.40. N. S.). Thus subjects in the high evaluation apprehension condition were not only more likely to criticize the experiment, but were also more concerned about the validity of their own experimental performance.

We continue our discussion of independent checks of the efficacy of our manipulations by turning briefly to the commitment variable. As Table 2 showed, the high commitment subjects were much less honest than the low commitment subjects, as was predicted. The effect is quite striking given the "weakness" of the manipulation; it consisted only in the experimenter (as well as the confederate) saying that the subject might have to return at a later date. Dissonance theory suggests that, "we come to love the things we work hard for". One way to summarize our data on the effect of our commitment variable is to say that we come to love the thing we expect to work hard for. High commitment subjects expected to put twice as much time and effort into the experiment than did the low commitment subjects. They valued their efforts more and wanted to ensure that their performance would not be in vain. Hence they confessed less.

We have independent evidence that the high commitment subjects were more interested in the experiment. As mentioned above, the subjects were given the opportunity of asking questions or discussing the experiment with the interviewer after the five-question interview was over. The high commitment subjects were much more likely to continue to talk about the experiment after they were free to go (77% as against 55% of the low commitment subjects, chi-square= 4.51, $p < .05$), a trend which supports our hypothesis with a check that is conceptually distinct from the amount confessed.

DISCUSSION

For the most part, our results are relatively straight forward. We did achieve an improved confession rate; the proportion denying all prior knowledge was reduced to 14%. Our two independent variable manipulations did have the intended effects. Our findings about the effects of commitment may be interpreted as leading to a refinement of cognitive dissonance theory.

Cognitive dissonance theory predicts that the more effort a subject expends, the more highly he will value the thing upon which the effort has been expended. In previous studies, the effort preceded the payoff, whereas in this study it was the anticipation of effort which was the antecedent condition--the actual expenditure of extra effort never took place. This purely cognitive antecedent condition is methodologically preferable in that it is entirely uncontaminated by extraneous factors.

One problem with "effect of effort" research has been that the various tasks that subjects have engaged in have necessarily had dimensions beyond that of pure effort. Researchers have therefore had difficulty separating the effects of the expenditure of effort from the other task dimensions, e.g., intrinsic interest, dullness, difficulty, etc. (Aronson and Carlsmith, 1968). We have avoided this contamination and shown that merely expecting to expend effort has the predicted effect on subjects' attitudes.

The effect of our second independent variable, evaluation apprehension, was in a direction contrary to our hypothesis, though independent evidence indicates that the manipulation "worked". Although the found relationship of evaluation apprehension to honesty was not predicted, it is not anomalous. Rosenberg's analysis allows for the very effect we found. In our previous discussion of Rosenberg's work, we alluded to his point that subjects who feel evaluation apprehension have available to them two main methods of reducing it. In most experiments, only one method is feasible, namely that of attempting to "figure out" the experiment in the hope of thereby being able to generate "appropriate" responses. The other method of reducing evaluation apprehension is that of derogating the research of the experimenter. This method is usually not open to most subjects. In our experiment, the second option was available to the subjects. The experimenter could be easily judged incompetent because the subject had unmistakable evidence that something had gone wrong with the experiment. An experimenter who was so maladroit as to allow veteran subjects to talk to future subjects could be seen as not qualified to make evaluations about the subject's adjustment. Even if the experimenter was not seen as inept, any particular subject would be able to neutralize evaluation apprehension by pointing out that his performance in the experiment could not be treated as valid because he had prior information. In our experiment, subjects in the high evaluation apprehension condition could use and did use both methods of reducing evaluation apprehension, i.e., they used their prior information in order to generate the responses appropriate for well adjusted persons, and they used the fact of their being informed to convince the experimenter that he could not have made a valid evaluation of their adjustment.

As researchers interested in the social psychology of experimental situations, one of our goals is to make recommendations which will enable experimenters to improve their experimental procedures. A situation faced by most experimenters is that an unknown proportion of their subjects may have prior knowledge of the nature of their experiment. Therefore it is important to know the conditions which will ensure a high rate of confession of prior information. The present experiment suggests that both high evaluation apprehension and low commitment increases the probability that subjects will admit prior knowledge of the experiment.

V. CONCLUSIONS AND RECOMMENDATIONS

Three studies were completed in the present project. All were related to the field of study know as the "social psychology of experimental situations", a field which has as its focus the social nature of experimental research involving human subjects.

The first study was a broad-based survey of students' reactions to experimentation in the social sciences and their reactions to other aspects of their college experiences. It was found that students do, indeed, have well-formed opinions about experimentation and that their opinions are related to their experiences as experimental subjects. However, the students' opinions seemed to have little relationship to their general reactions to college.

The second study, a simulated or "role-playing" experiment, showed that the results of an important social psychological experiment could be replicated using essentially non-experimental methods. It therefore must be considered strongly likely that the results of the original study were a function of uncontrolled "social" features of the experimental situation.

Finally, in a "real" experiment, it was shown that the extent to which subjects will be honest in a post-experimental interview is a positive function of the extent to which they are apprehensive about being evaluated by the researcher and a negative function of the extent to which they are committed to the research in which they are participating.

The conclusions that may be drawn from the various studies completed during this project may be rather simply summarized. It is clear that researchers have much to learn from studying the social psychology of experimental situations. Student-subjects <u>do</u> come to experiments with well-formed opinions about the activities in which they are about to engage. They <u>do</u> respond to experimental events within the context of those opinions. And subjects not only respond to the games experimenters play, they also invent games of their own, games that experimenters may have little information about. If the social science disciplines which depend upon experimentation are to truly contribute to knowledge about human affairs, it is incumbent upon them to seriously and actively pursue the study of their primary resource--the "all too human" experimental subject.

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APPENDIX A

INTERVIEW SCHEDULE

Student Survey

1 2 3
[ ][ ][ ]

INTRODUCTION: Hello, my name is _____. I am working on a survey of student opinion for a sociology class. May I show you this letter as a means of identifying myself.

---

1. A. O.K. First let me ask you this. Everyone seems to feel a little differently about the new quarter system. Do you like the quarter system or do you prefer the semester system?

Quarter system 4-1
Semester system 2
No preference 3

B. Why do you feel this way?

_____

_____

_____

2. Now I'm going to read you some statements that describe the behavior of faculty members and students on this campus. Please tell me if you agree or disagree with each statement.

A. The main emphasis in courses is on repeating what the faculty member has said in class.

Agree 5-1
Disagree 2
No opinion 3

B. Most students are genuinely interested in studying and learning.

Agree 6-1
Disagree 2
No opinion 3

C. Faculty members seem interested in their students.

Agree 7-1
Disagree 2
No opinion 3

D. College spirit is very strong.

Agree 8-1
Disagree 2
No opinion 3

3. Now I'm going to read four statements about the purposes or results of college. I would like you to tell me which one is most important to you personally. (READ STATEMENTS LISTED BELOW AND CIRCLE MOST IMPORTANT:) Now please tell me which one you think is most important to the typical student here. (READ STATEMENTS AGAIN AND CIRCLE RESPONSE.)

	Most important to respondent.	Most important to typical student.
A. A basic general education and appreciation of ideas	9-1	10-1
B. Having a good time while getting a degree.	9-2	10-2
C. Career training	9-3	10-3
D. Developing the ability to get along with different kinds of people	9-4	10-4

4. O.K., now I'd like to change the subject slightly to one part of campus life that we're particularly interested in. As you may know, social scientists in the last few years have been very active in conducting experimental studies of human behavior. Of course, many social scientists continue to do questionnaire and interview studies, like the one we're doing. But increasingly they attempt to bring students to a laboratory or some other meeting place where the students serve as subjects in an experiment. Have you ever served as a subject in any experiment conducted by a psychologist, a sociologist, or any other other social scientist?

Yes 11-1
No 2

5. Fine. Well what I'd like you to do now is this. (HOLD UP DESCRIPTION OF EXPERIMENT.) What I have here is a complete written description of a psychology experiment which was actually done a short time ago. It is a complete report of everything a subject experienced from the time he arrived for the experiment until the time he left. Now what I'd like you to do is to read this description and pretend that you are actually experiencing what is described. That is, read this as if it is a description of what you are doing in an experiment. Please read it carefully, because afterward I'd like to ask you some questions which were actually asked of the subjects who participated in this experiment. (HAND THE RESPONDENT THE DESCRIPTION.)

(WHEN THE RESPONDENT HAS FINISHED READING THE DESCRIPTION, ASK HIM TO HAND IT BACK TO YOU.) O.K., now I'd like to ask you some questions about your experiences in this experiment. I will act as if I am the interviewer from the introductory psychology class. Please answer my questions as honestly and frankly as you can, as if you actually just experienced what was described. Remember, I am, for the moment, the interviewer from the introductory psychology class.

A. Did you find the "spool" and "peg-board" tasks you performed interesting and enjoyable?

	*Yes	12-1
	**NO	2

*(1) (IF 'YES', ASK) In what way were they enjoyable?

_____ 13 ☐

_____

**(2) (IF 'NO', ASK) In what way were they not enjoyable?

_____ 14 ☐

_____

(3) Would you rate how you feel about the experimental tasks on a scale from -5 to +5 where -5 means they were extremely dull and boring, +5 means they were extremely interesting and enjoyable, and zero means they were neutral, neither interesting nor uninteresting. 15 ☐

B. Did the experiment give you an opportunity to learn about your own ability to perform these tasks?

	*Yes	16-1
	No	2

*(1) (IF 'YES', ASK) In what way?

_____ 17 ☐

_____

**(2) (IF 'NO', ASK) In what way not?

_____ 18 ☐

_____

(3) Would you rate how you feel about this on a scale from 0 to 10 where 0 means you learned nothing and 10 means you learned a great deal. 19 ☐

C. From what you know about the experiment and the tasks involved in it, would you say the experiment was measuring anything important--that is, do you think the results may have scientific value?

*Yes 20-1
**No 2

*(1) (IF 'YES', ASK) In what way?

_____ 21 ☐

_____

**(2) (IF 'NO', ASK) In what way not?

_____ 22 ☐

_____

(3) Would you rate your opinion on this matter on a scale from 0 to 10 where 0 means the results have no scientific value or importance and 10 means they have a great deal of value and importance. 23 ☐

D. Would you have any desire to participate in another <u>similar</u> experiment?

*Yes 24-1
**No 2

*(1) (IF 'YES', ASK) Why?

_____ 25 ☐

_____

**(2) (IF 'NO', ASK) Why not?

_____ 26 ☐

_____

(3) Would you rate your desire to participate in a similar experiment again on a scale from -5 to +5 where -5 means you would definitely dislike to participate, +5 means you would definitely like to participate, and 0 means you have no particular feeling about it one way or the other. 27 ☐

E. Now I'd like you to tell me what you think the experiment was all about. In other words, what was the experimenter trying to find out? 28 ☐

_____

_____

_____

F. From the time you arrived for the experiment until the time you left, including everything you did while in the building, did you become suspicious of anything that went on or anything the experimenter said or did?

*Yes 29-1
**No 2

*(1) (IF 'YES', ASK) What were you suspicious about and why did you become suspicious?

_____ 30 ☐ 31 ☐

_____

_____

*(2) Did your suspicions affect the way you answered the questions I asked you earlier? _____ Why or why not?

_____ 32 ☐ 33 ☐

_____

_____

**(3) (IF 'NO', ASK) What was the reason that you didn't become suspicious about anything?

_____ 34 ☐

_____

G. Some students say that experimenters never tell you the true purpose of their experiments. Others say that most experimenters do tell their subjects the true purpose of their experiments. Do you believe that your experimenter told you the true purpose of his study?

Yes 35-1
No 2

6. Fine. (PAUSE) Now let's get away from questions about this make-believe experiment and move on to a few questions which deal with real experiments. By the way, don't ask me what the "as if" experiment was really about, (IF THE RESPONDENT ASKS YOU WHAT THE "AS IF" EXPERIMENT WAS REALLY ABOUT, EXPLAIN TO HIM THAT YOU, YOURSELF, HAVE NOT BEEN TOLD WHAT IT WAS ABOUT). (IF RESPONDENT SAID IN QUESTION 4., PAGE 2., THAT HE HAS NOT SERVED AS AN EXPERIMENTAL SUBJECT, SKIP TO QUESTION 21 , PAGE 10.)

(IF THE RESPONDENT SAID IN QUESTION 4., PAGE 2., THAT HE HAS SERVED AS AN EXPERIMENTAL SUBJECT, ASK HIM THE FOLLOWING QUESTIONS.)

ASK "EXPERIENCED SUBJECTS" ONLY

O.K., now you said that you have served as a real experimental subject. About how many experiments have you participated in? _____ 36 ☐

7. Please recall the last experiment in which you served as a subject. About how long ago was it that you were in that experiment? _____ _____ 37 ☐

8. Why did you participate in the experiment?

Course requirement	38-1
Got extra credit in course if volunteered .	2
Got paid money for volunteering	3
It was purely voluntary	4
Other (Specify) _____ . .	5

9. Can you tell me in general what went on during the experiment, that is, what did you actually do in the experiment? 39 ☐

_____

_____

_____

_____

10. What, if anything, was there about this experiment that you particularly liked? 40 ☐

_____

_____

_____

11. What, if anything, was there about this experiment that you particularly <u>disliked</u>? 41 ☐

12. Do you think that you did a good job as an experimental subject or do you think you could have done a better job as an experimental subject? _____ Why do you feel this way? 42 ☐ 43 ☐

13. In general, do you think the experiment in which you participated was a worthwhile one or one that was not very worthwhile? _____ Why? 44 ☐ 45 ☐

14. What do you think the experimenter was trying to find out in his study? 46 ☐ 47 ☐

15. Did the experimenter ever directly <u>tell</u> you what the purpose of the experiment was <u>before</u> it began, <u>during</u> the experiment, or <u>after</u> it was over?

Before	48-1
During	2
After	3
He <u>never</u> told us the purpose	4
Other _____	5

16. Did the person who served as the experimenter do a good job or do you think that he could have done a better job? _____ Why? 49 ☐ 50 ☐

17. Were there any other subjects who went through the experiment at the same time you did?

*Yes 51-1
No 2

*(1) (IF 'YES', ASK) Did you talk to them about the experiment before it began?

Yes 52-1
No 2

(2) After it was over?

Yes 53-1
No 2

18. It is a common practice for experimenters to ask subjects not to talk to other students about their experiences in an experiment. Did your experimenter ask you not to talk about his study?

*Yes 54-1
**No 2

*(IF 'YES', MAKE THE FOLLOWING STATEMENT TO THE RESPONDENT BEFORE YOU READ THE NEXT QUESTION.) Most students say that even though they have been asked not to talk about an experiment, they nevertheless usually do talk to some of their friends and acquaintances about it.

**(1) (ASK THE FOLLOWING QUESTION OF BOTH THOSE WHO ANSWERED 'YES' AND 'NO' ABOVE.) Did you talk to other students about the experiment in which you participated?

*Yes 55-1
No 2

*(2) (IF 'YES', ASK) About how many persons did you talk to? _____ 56 - 57

19. Have other students ever talked to you about their experiences in an experiment?

*Yes 58-1
No 2

(IF 'YES', ASK) About how many others have talked to you? _____ 59 - 60

20. O.K. Now let's move on to a different type of question. Will you please look at this sheet of paper? (HAND RESPONDENT SHEET OF PAPER WITH ATTITUDE SCALE ON IT.) Now what I'm going to do is to read a series of statements which have to do with social science experiments. After I read each statement, please give me a number which best describes your reaction to the statement. As you can see, 0 means that you very strongly disagree with the statement and 9 means that you very strongly agree with the statement. Numbers 4 or 5 are almost neutral, but 4 means that you slightly lean to disagreement and 5 means that you slightly lean to agreement. Please choose one number in deciding what you think about each statement, even though you may feel it does not fully express all aspects of your opinion about the statement.

In answering the first few statements that I will read, please respond again in terms of your experiences in the last experiment in which you participated. O.K.

A. I found that I enjoyed being an experimental subject very much . . . ___ 61

B. My experimenter did not seem to know what he was doing in conducting his experiment . . . . . ___ 62

C. I was a little nervous while participating in the experiment . . . . ___ 63

D. The experimenter I had was relaxed and informal in his behavior . . ___ 64

E. While I was in the experiment, I was not particularly concerned with trying to figure out the experimenter's hypothesis . . . . . ___ 65

F. I took my duties as an experimental subject very seriously . . . . . ___ 66

G. I think that the findings of the experiment in which I participated were very accurate . . . . . ___ 67

H. I did some things to purposely foul up the experimenter's findings . ___ 68

I. I was too rushed for time to do my best on the experimental task . . ___ 69

J. The experimenter was a very pleasant and very helpful person . . . . ___ 70

K. The instructions the experimenter gave me were not very clear and I had some doubts about what I was supposed to do . . . . . ___ 71

L. The room in which the experiment took place was very pleasant . . . ___ 72

Now I'd like to read some statements that refer to social science in general and to social science experiments. Please respond to these statements, not in terms of your experiences in any particular experiment, but rather in terms of your general opinions and feelings about each item.

(SKIP TO STATEMENTS, QUESTION 35, PAGE 14)

73	74	75	76	77	78	79	80
2						E	1

1 2 3

21. O.K., now you said that you have not served as a real experimental subject. Has any other student ever told you about his or her participation in an experiment?

*Yes 4-1
**No 2

*(1) (IF 'YES', ASK) About how many students have you talked to about their participation in experiments? 5

**(IF 'NO', SKIP TO QUESTION 29, PAGE 12)

ASK ONLY THOSE WHO HAVE TALKED TO OTHERS

22. When other students talk to you about experiments, what do they say, in general, that is what do they usually mention about their experiences? 6

23. What, if anything, do the subjects you have talked to, say that they particularly like about experiments? 7

24. What, if anything, do the subjects you have talked to, say that they particularly dislike about experiments? 8

25. From talking to these students, did you get the impression that most of them did good jobs as experimental subjects or do you think most of them did poor jobs as experimental subjects? _____ Why?

_____ 9 ☐ 10 ☐

_____

_____

26. From talking to these subjects, do you think that most of them regard experiments as worthwhile or do you think that most of them feel experiments are not very worthwhile ? _____ Why?

_____ 11 ☐ 12 ☐

_____

_____

27. How did the subjects you talked to regard the person who served as their experimenter? That is, is it your impression that most subjects react favorably or unfavorably to their experimenter? _____ Why?

_____ 13 ☐ 14 ☐

_____

_____

28. From having heard about experiments from people who have served as subjects, what overall conclusion have you come to about the usefulness of experiments in the social sciences?

_____

_____ 15 ☐

_____

O.K. Now let's move on to a different type of question. Will you please look at this sheet of paper? (HAND RESPONDENT SHEET OF PAPER WITH ATTITUDE SCALE ON IT). Now what I'm going to do is to read a series of statements which have to do with social science and with social science experiments. After I read each statement, please give me a number which best describes your reaction to the statement. As you can see, 0 means that you very strongly disagree with the statement and 9 means that you very strongly agree with the statement. Numbers 4 or 5 are almost neutral, but 4 means that you slightly lean to agreement. Please choose one number in deciding what you think about each statement, even though you may feel it does not fully express all aspects of your opinion about the statement.

(SKIP TO STATEMENTS, QUESTION 35, PAGE 14)

ASK THOSE WHO HAVE NEITHER TALKED NOR ARE EXPERIENCED

29. O.K. Now I'd like to shift the subject slightly and get some of your opinions about general courses of study in the university. Some students believe that a university education should serve primarily as the preparation for a later career, others feel that a university education should emphasize general cultural learning. What is your opinion?

11 ☐

30. More and more people are continuing their education into graduate school. Do you think you will go to graduate school? _____ Why or why not? 12 13 ☐☐

31. Some students say that they have become importantly changed persons because of their college experiences. Others say that they haven't changed that much. How much do you think college has changed you? _____ In what ways have you changed?

14 15 ☐☐

In what ways are you unchanged?

16 ☐

32. Have there been any courses you have taken which have made a particularly strong impression on you? _____ Why or why not?

17 18 ☐☐

33. Have their been any books that you've read that have made a particularly strong impression on you? _____ Why?

_____ 19 20

_____

_____

34. Have their been any friends that you've made since coming to college who have changed your fundamental values in important ways? _____ in what ways?

21 22

_____

_____

_____

O.K. Now let's move on to a different type of question. Will you please look at this sheet of paper? (HAND RESPONDENT SHEET OF PAPER WITH ATTITUDE SCALE ON IT). Now what I'm going to do is to read a series of statements which have to do with social science and with social science experiments. After I read each statement, please give me a number which best describes your reaction to the statement. As you can see, 0 means that you very strongly disagree with the statement and 9 means that you very strongly agree with the statement. Numbers 4 or 5 are almost neutral, but 4 means that you slightly lean to disagreement and 5 means that you slightly lean to agreement. Please choose one number in deciding what you think about each statement, even though you may feel it does not fully express all aspects of your opinion about the statement.

(ASK THESE OF ALL RESPONDENTS)

35. O.K. Here are the statements.

A. Experiments are a very important means of increasing our knowledge of human behavior . . . . . ___ 23 ☐

B. Few students look forward to serving as subjects in social science experiments . . . . . ___ 24 ☐

C. I have great respect for the physical sciences . . . . . ___ 25 ☐

D. I doubt that experiments with human subjects will ever produce knowledge which will be of much benefit to mankind. . . ___ 26 ☐

E. Most students seem to enjoy the experiments in which they participate . . . . . ___ 27 ☐

F. Most students are annoyed when they find out that a course requirement is that they serve as experimental subjects . . . ___ 28 ☐

G. I have little respect for the social sciences . . . . . ___ 29 ☐

H. Subjects in experiments are often uncomfortable because of what the experimenter might find out about them . . . . . ___ 30 ☐

I. I have little respect for the humanities . . . . . ___ 31 ☐

J. Many experimental subjects try to behave in such a way that the experimenter's hypothesis will be confirmed . . . . . ___ 32 ☐

36. Fine. Now we have just a few background questions.

A. What is your year in college?

Freshman 33-1
Sophomore 2
Junior 3
Senior 4
Graduate 5

B. What is your age?

17 or younger . . 34-1
18 2
19 3
20 4
21 5
22 6
23-24 7
25-29 8
30 or older 9

C. What is your major? _____ (IF UNDECLARED, ASK:)
What do you think you'll end up majoring in? _____ 35 ☐

D. Have you had any courses in sociology?

*Yes 36-1
No 2

*(1) (IF 'YES', ASK) About how many courses have you had? ___ 37 ☐

E. Have you had any courses in psychology?

*Yes 38-1
No 2

*(1) (IF 'YES', ASK) About how many courses have you had? ___ 39 ☐

F. What is your grade point average? _____ 40 ☐ 41 ☐

G. What is your marital status?

Married 42-1
Single 2
Widowed 3
Divorced 4
Separated 5

H. Do you belong to a fraternity (sorority)?

Yes 43-1
No 2

I. (1) How many younger brothers do you have? ____ 44

(2) How many younger sisters do you have? ____ 45

(3) Older brothers . . . . . ____ 46

(4) Older sisters . . . . . ____ 47

J. What is your religious affiliation?

Protestant 48-1*
Catholic 2
Jewish 3
Other (Specify) . . _____

*IF "PROTESTANT", ASK: WHAT DENOMINATION?

49 ☐

_____

K. What was your father's occupation while you were in high school? (What kind of work did he do?) _____ 50 ☐

_____

L. What was the highest year of school he completed ?

8th grade or less . . 51-1
Part High school . . . 2
High school graduate . 3
Part College 4
College graduate . . . 5
Graduate degree or professional degree beyond the bachelor's 6
Don't know 9

Thank you very much for your cooperation.

IMPORTANT: COMPLETE THE QUESTIONS BELOW IMMEDIATELY AFTER LEAVING THE RESPONDENT

Where does the respondent live?

Dorm	52-1
Fraternity (Sorority)	2
Apartment	
Supervised	3
Approved	4
Unsupervised	5
At home	6

How cooperative was the respondent during most of the interview?

Very cooperative	53-1
Somewhat cooperative	2
un-cooperative	3
Very un-cooperative	4

Physical Description of the Respondent:

White male	54-1
White female	2
Negro male	3
Negro female	4
Other (race) male	5
Other (race) female	6

Interviewer's name _____

Respondent's name and address _____

_____ Phone number: _____

APPENDIX B

DESCRIPTION OF THE SIMULATED EXPERIMENT

DESCRIPTION OF A PSYCHOLOGY EXPERIMENT

At the beginning of the quarter, your instructor in an introductory psychology course tells you that as part of the course requirement you must sign up for a two-hour psychology experiment. He also tells you that another part of the course requirement is that you agree to be interviewed by a member of the psychology department after the experiment in which you participate. The instructor explains that the psychology department wants to interview subjects so that they can evaluate experiments and possibly improve them in the future. You are therefore urged to be completely frank and honest if you are interviewed after any experiment in which you take part. After the class, you sign up for a two-hour experiment called, "Measures of Performance."

Later in the quarter, when you arrive for the experiment on "Measures of Performance", you have to wait for a few minutes in the office of the experimenter's secretary. The experimenter then comes in, introduces himself to you, and shows you to the laboratory room. There the experimenter says:

"This experiment usually takes a little over an hour but, of course, we had to schedule it for two hours. Since we have that extra time, the introductory psychology people asked if they could interview some of our subjects. Did they announce that in class? (You reply that they did.) I gather that they're interviewing some people who have been in experiments. I don't know much about it. Anyhow, they may want to interview you when you're through here."

You are then told about the first experimental task which involves putting 12 spools into a tray, emptying the tray, refilling it with the spools, and so on. You are told to use one hand and to work at your own speed. You continue putting the spools into the tray, emptying it, and putting them back in again, for approximately one-half hour.

One-half hour later the experimenter removes the tray and spools and places in front of you a board containing 48 square pegs. He tells you that your task is to turn each peg a quarter turn clockwise, then another quarter turn, and so on. You are again told to use one hand only and to work at your own speed. You then work at this task for another one-half hour.

While you are working on your tasks, you see that the experimenter is looking at a stop watch and recording some figures on a sheet of paper.

After you have finished both tasks, the experimenter puts away his stop watch and papers, lights a cigarette, pushes his chair back and says:

"O.K. Well, that's all we have in the experiment itself. I'd like to explain what this has been all about so you'll have some idea of why you were doing this. Well, the way the experiment is set up is this. There are actually two groups in the experiment. In one, the group you were in, we bring the subject in and give him essentially no introduction to the experiment. That is, all we tell him is what he needs to know in order to do the tasks, and he has no idea of what the experiment is all about, or what it's going to be like, or anything like that."

"But in the other group, we have a student that we've hired that works for us regularly, and what I do is take him into the next room where the subject is waiting--the same room you were waiting in before--and I introduce him as if he had just finished being a subject in the experiment. That is, I say "This is so-and-so, who's just finished-the experiment, and I've asked him to tell you a little of what its about before you start.' The fellow who works for us then, in conversation with the next subject, makes these points: 'It was very enjoyable, I had a lot of fun, I enjoyed myself, it was very interesting, it was intriguing, it was exciting.' Now of course, we have this do this because if the experimenter does it, it doesn't look as realistic, and what we're interested in doing is comparing how these two groups do on the experiment--the one with this previous expectation

about the experiment, and the other, like yourself, with essentially none."

Control Group

"Is that fairly clear? (You answer 'Yes'). Good. Look, that fellow I was telling you about from the introductory psychology class said he would get here a couple of minutes from now. Would you mind waiting to see if he wants to talk to you? (You answer that you wouldn't mind). Fine. Why don't we go into the other room to wait?"

The experimenter then leads you back toward the secretary's office. As you walk along, the experimenter says:

"Thanks very much for working on those tasks for us. I hope you did enjoy it. Most of our subjects tell us afterward that they found it quite interesting. You get a chance to see how you react to the tasks and so forth."

After you arrive at the secretary's office, you sit down and the experimenter leaves for about four minutes and you wait in the office. When the experimenter comes back, he says:

"O.K. Let's check and see if he does want to talk to you."

The experimenter then leads you to the office of the interviewer from the beginning psychology class. The experimenter asks the interviewer if he wants to talk to you. The interviewer says yes, the experimenter shakes hands with you, says good-bye, and leaves.

One and Twenty Dollar Conditions

"Is that fairly clear how it is set up and what we're trying to do? (You answer 'Yes'). Now, I also have a sort of strange thing to ask you. The thing is this. The fellow who normally does this for us couldn't do it today--he just phoned in, and something or other came up for him--so we've been looking around for

someone that we could hire to do it for us. You see, we've got another subject waiting who is supposed to be in that other condition. Now Professor Johnson, who is in charge of this experiment, suggested that perhaps we could take a chance on your doing it for us. I'll tell you what we had in mind: the thing is, if you could do it for us now, then of course you would know how to do it, and if something like this should ever come up again, that is, the regular fellow couldn't make it, and we had a subject scheduled, it would be very reassuring to us to know that we had somebody else we could call on who knew how to do it."

"So, if you would be willing to do this for us, we'd like to hire you to do it now and then be on call in the future, if something like this should ever happen again. We can pay you one (twenty) dollar for doing this for us, that is, for doing it now and then being on call. Do you think you could do that for us? It will only take a few minutes, and the regular person is pretty reliable; this is the first time he has missed. If we needed you we could phone you a day or two in advance; if you couldn't make it, of course, we wouldn't expect you to come."

You agree to help the experimenter by taking the job of giving the waiting subject the introduction to the experiment. So the experimenter shows you a sheet of paper which mentions the points you should make in talking to the subject who is waiting. The points are: The experiment was very enjoyable, I had a lot of fun, I enjoyed myself, it was very interesting, it was intriguing, it was exciting.

After you read the paper through, the experimenter pays you one (twenty) dollar, makes out a hand-written receipt form for one (twenty) dollar, and asks you to sign it. You do sign it.

The experimenter then says:

"O.K., the way we'll do it is this. As I said, the next subject should be here by now. I think the next one is a girl. I'll take you into the next room and introduce you to her, saying that you've just finished the experiment and that

we've asked you to tell her a little about it. And what we want you to do is just sit down and get into a conversation with her and try to get across the points on that sheet of paper. I'll leave you alone and come back after a couple of minutes. O.K.? (You say 'Yes').

The experimenter then leads the way back to his secretary's office where you had previously waited and where the next subject, a girl, is now waiting. (The secretary is not in her office.) The experimenter introduces you to the subject and tells her that you have just finished the experiment and will tell her something about it. The experimenter then leaves and you tell the girl that the experiment was very interesting, enjoyable, etc.

The girl is quiet most of the time, but finally says that a friend of hers took the experiment the week before and told her that it was boring and that she ought to try to get out of it. You respond that what she was told isn't true, and you again try to convince the girl that the experiment was interesting and exciting, etc. The girl then indicates that she believes you and accepts what you have told her about the experiment.

At this point the experimenter returns to the room, thanks you for talking to the girl, writes down your phone number for "future reference," and leads you toward another room where the interviewer from the introductory psychology class is waiting to interview you about the experiment in which you have participated.

As you walk along, the experimenter says:

"Thanks very much for working on those experimenter tasks for us. I hope you did enjoy it. Most of our subjects tell us afterward that they found it quite interesting. You get a chance to see how you react to the tasks and so forth."

When you arrive at the office of the interviewer from the beginning psychology class, the experimenter asks the interviewer if he wants to talk to you. The interviewer says yes, the experimenter shakes hands with you, says good-bye, and leaves.